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Making great videogames is like creating any major work of art: rarely orthodox, frequently characterised by hardship, and sometimes just plain odd. Of course, this makes the stories behind them worth telling, and that's what this special 'making of…' edition of **Retro** is all about.

Did you hear about the chart-topping future sports game whose entire design was sketched out on the back of a cigarette packet over a couple of beers?

How about the martial arts classic whose audio was recorded by a group of overenthusiastic designers shouting at the top of their lungs slap bang in the centre of Sydney's throbbing red-light district?

Then there's the 3D combat sim whose development sparked such interest that the American Army requested that its creators make a custom, overhauled version that could be used in training its troops.

The unexpurgated tales behind these particular games – and 30 others – are laid bare over the following pages, covering videogaming's inception way back in 1962 and running right up to the 16bit era. Appearing regularly throughout are the little sparks of magic, those intangible moments when legends such as *Civilization* are born, that so characterises the evolution of the videogame form.

Moreover, you can almost feel the wide-eyed innocence in these developers' testaments. The cliché, like so many others, is true: they don't make 'em like they used to.

While the stories behind classics are fascinating for those who played and loved them, it's also hoped that they'll provide enlightenment to all those toiling over new types of videogame right now, maybe even fostering flashes of inspiration that may themselves be written about in the years to come.

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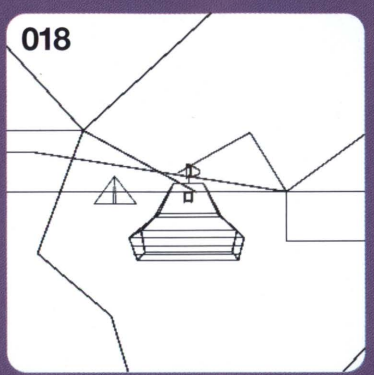

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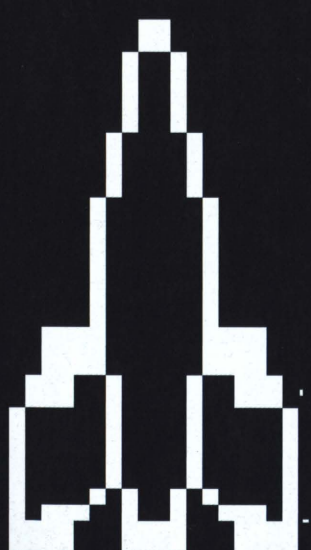
RETRO

Spacewar!

While *Halo* may be one of the best videogames of all time, played on a $200 console, spare a thought for Steve Russell's creation – the first ever videogame ran on a $120,000 piece of hardware. **Edge** goes back in time, to the summer of 1962



Original format: **PDP -1**
Publisher: **n/a**
Developer: **Steve Russell**
Origin: **US**
Release date: **1962**

It is a computer lab as we know all computer labs to be: whitewashed concrete-block walls; linoleum floor; a long row of blinds that are, of course, always closed. A group of long-haired coders in their mid-20s are gathered around the bright light of the screen. It's 3am, but no one wants to go home: they're all clamouring to play next. The two lucky enough to have the controls are holding their arms up, their elbows sore with repetitive strain injury from playing the game. "No!" they shout. "Turn! Fire! Argh…"

It's a familiar scene – *Quake III*, you might be thinking; *Halo* perhaps, or even a game of *Asteroids* – except Marilyn Monroe is still alive, aerial photography has just picked up Soviet cruise missile bases on the shores of Cuba, and it has been barely a year since President John F Kennedy swore – to the disbelief of a nation – that by the end of the decade the US will put a man on the moon. This is 1962, the dawn of the space race, and we're doing our bit for the sci-fi dreams of a nation: playing *Spacewar!*, the first ever videogame.

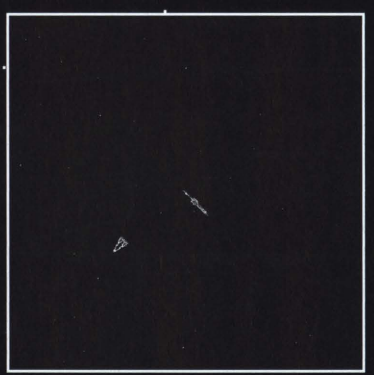
You thought the Xbox was bulky, but the engine of this game is not console- or even PC-sized, but a PDP-1, a computer whose banks fill a room. The PDP is a gift, recently delivered from Digital Equipment Corporation to the MIT Research Lab for Electronics, in the hope that MIT might invent novel uses for the new technology. Well, these first-generation hackers in their mid-20s have certainly found something to do with their spare processor time. The game they're playing, a proto-*Asteroids* in which two ships wheel around a blazing sun firing photon torpedoes, against a pixel-perfect starfield (this is MIT, after all), has kept them here until 3am for the last week.

Let's say it again: the first ever videogame. For all those lost hours spent with Mario, Solid Snake, terrorists, counter-terrorists, jumping from platform to platform, cutting your lap-times, shooting through rifle-scopes – you can blame this game.

In fact, if you like, you can blame it on science fiction. It was the novels of EE 'Doc' Smith that did it. The three intrepid, cylinder-head robot-flick-loving, Schwinn-riding children of the '50s at the heart of the *Spacewar!* phenomenon – Wayne Witaenem, **Martin Graetz**, and **Stephen 'Slug' Russell** – were big fans of the Doc's 'Skylark' and 'Lensman' series. It was an apt inspiration: Smith's formulaic sci-fi paperbacks pre-empted the wave-upon-wave relentlessness of *Space Invaders* ("Well done, Earthling… now do battle with our super forces") by over a decade.

Powerful forces

"Doc Smith was not Shakespeare," Russell says of his reading habits at the time. "The heroes went around the universe being chased by the villains, the heroes defeated the villains just in time – then at the start of the next book, the villains turned out to be just the wimpy assistants for the incredibly powerful forces of evil. And then in the next book… The colours were bright, and there was lots of action." At the time, though, as Russell remembers, computers couldn't have been further from such fast-paced sci-fi action. "With most of the other



One fat rocket, one thin. *Spacewar!* still proved addictive enough to keep the boys at MIT up until 3am. A pattern which many Edge readers may have followed ever since

computers, you had to have an engineer who understood the power sequence: turn on a power supply, then another power supply, make sure they started right, there was no smoke, then a third power supply. You had to be elected trustworthy just to turn it on. And the way you used a computer was, you punched a bunch of IBM cards with your program, and you submitted them to a good-sized bureaucracy. And in the fullness of time you would get back a pile of white paper." The new PDP-1, however, was something else. "The PDP-1 didn't have a high-speed printer, and it didn't have a bureaucracy. It had a typewriter and a paper tape reader and a paper tape punch. In a sense it was the first personal computer, in that you could sit down and flip the power switch, and you could start using it."

It was new enough to make you put down your Doc Smith novels and take note. "Long before the PDP-1 was up and running," remembers Graetz, "Wayne, Slug and I had formed a sort of ad-hoc committee on what to do with it." The trio decided that the ideal demo program should not only tax the resources to the limit, and be different every time; it should also be active, even pleasurable: in short, it should be a game. Graetz remembers their first conversation. "Wayne said, 'Look, you need action, and you need some kind of skill level. It should be a game where you have to control things moving around on the 'scope like, oh, spaceships.' '*Spacewar!*' we shouted."

Primordial soup

Nineteen-sixty-two, the space race, Doc Smith, long hair, spaceships chasing each other across the galaxy. It may have been a dark and stormy night; lightning might have flashed when research assistant 'Slug' Russell first flicked that PDP-1 switch; or it might not. Either way, out of this electronic primordial soup, in this dark research laboratory, arose a lumbering monster of a way to kill time. The idea leapt from their paperbacks on to the curved green screen in a flash.

Or would have, if Russell could be bothered to do anything about it. True to the form he was busy establishing, Russell had the hacker's reluctance to actually do any work, as Graetz recalls: "Russell, never one to do something when there was an alternative, begged off for one reason or another." One excuse was there were no sine-cosine routines for the PDP-1. Then a colleague, Alan Kotok, came back from a trip all the way to DEC headquarters with the sine-cosine paper tapes, and Russell had no more excuses. "So I finally sat down and worked at it," Russell remembers. Working with the restrictions of the PDP-1's 4,096 words of 18bits each, "I wrote the space with no gravity, with the two ships and some controls."

With no point of reference and no friction, the two ships skidded somewhat surreally across the screen. "We tried it," says Russell, "and decided it wasn't as satisfying as it could be." A colleague, Dan Edwards, got Newtonian gravity working around the pixellated sun, and another, Pete Sampson, wrote a program called 'Expensive Planetarium'. "At the time," remembers Russell, "the trend was for 'expensive this', 'expensive that'. 'Expensive Desk Calculator' was a desk calculator, but it used a $120,000 computer instead. 'Expensive Planetarium' had a star display that was realistic, and used a real star map."

Spacewar! eventually came to the MB Vectrex and benefited from its vector display. Obviously, PDP-1s are not easy to come by – these images are emulations of the original

For controls, they rigged up a bank of 18 switches. But, as Russell remembers, "There were two serious disadvantages: one, they clicked, so if you heard the other player going click, click, click, you figured they were out of torpedoes. The other disadvantage was that it was a little high, so your elbows got tired because they were resting on the table. We rummaged around under the model railway club table and found four boxes with four push-buttons, which were used for '40s telephones. Fortunately the PDP-1 had a wire for additional input, so we wired those in."

They had it. At the command of those push-buttons, the two ships – one rounded V2-style rocket and another slimmer, meaner machine – now wheeled in a dogfight around the sun, firing photon torpedoes against a pixel-perfect starfield. A hyperspace function was added, so at any moment the panicked pilot could hit a button and take his chances against rematerialising in the centre of the sun. There was even a power-move, the gravity slingshot, in which the skilled player could double his or her speed in a tight flick around the sun. The screen, a tiny box with a curved green glass front, was phosphor based: each pixel lit up in brilliant green before fading slowly through yellow into black. All the ships, stars, and photon torpedoes had gentle yellow analogue trails, tracing out these young men's hopes – and their whole generation's yearning – to project themselves into outer space.

In the years to come, a fellow MIT regular named Nolan Bushnell will create a standalone version of *Spacewar!*: a curvy supermodel of an arcade cabinet to be called *Computer Space*. That will flop, so the company he will found – a garage startup called Atari – will make some modifications, turn it into a singleplayer game, and call it *Asteroids*. "They actually hit on the thing which made it viable as a commercial game," remembers Russell now, "which is they put in a piece of unrealism which made it much easier to learn. They put viscosity in space."

But before *Asteroids* was fun, *Spacewar!* was fun. "The thing that pleased me the most," says Russell, "was that the idea was so contagious. A lot of people, ten or 20 at least, saw *Spacewar!* and didn't have access to the sources or were on a different machine, and figured out how to do it on other machines. And I think it was the world's most popular computer game, such as it was, for a year or two.

"It was fun. No, we didn't feel any great cosmic significance. We looked very briefly at trying to make money off it, but it turned out at the time you couldn't copyright software and you couldn't patent software. We thought about it for a week, then decided, nah, there wasn't any hope, so we gave away the sources freely."

"We looked very briefly at trying to make money off it, but it turned out at the time you couldn't copyright software and you couldn't patent software. So we just gave it away freely"

Spacewar! is not just the first computer game, it's a landmark in any history of computing. "I was using what is considered current technology," says Russell. "The spaceships and torpedoes are in fact polymorphic objects. It was object-oriented code." You can play a Java version of *Spacewar!* online (http://agents.www.media.mit.edu/groups/el/projects/spacewar/). The game runs on a PDP-1 simulator, and Russell thinks it's the oldest program still running on the original source code.

The game was so good, it became a problem. The log-books from the PDP-1 still record the names of AI luminaries such as Marvin Minsky alongside whole blocks in the evenings and throughout the weekends marked simply '*Spacewar!*'. The game was officially designated the lowest priority in use of the machine, which drove the MIT students and workers to play late into the night. Which is where we found them.

We could interrupt them. True to the form of the science fiction that inspired them, we could tap them on the shoulder, give them advice, change the game – "Call it *Quake*; make it 3D" – set whole chains of alternate histories cascading into motion. But the history they built for us hasn't disappointed, has it? Game after game after game, all descended from this one. A trail of sprites and polygons and explosions leading across 40 years back to *Spacewar!*, like the fading yellow ghosts on an old curved phosphor screen.

Asteroids

In the late '70s, space invaded videogames. However, while Japan delivered wave after wave of alien intruders, engineers at Atari's US HQ began to toy with less animated foe. And so a legend was born...

Original format: **Coin-op**
Manufacturer: **Atari**
Developer: **In-house**
Origin: **US**
Release date: **1979**

When Atari released *Asteroids* in 1979, the game did something that very few coin-operated arcade games had ever done before. It kept selling. Months after its introduction, when the sales cycle for an arcade game should have ended, its manufacturer kept receiving orders.

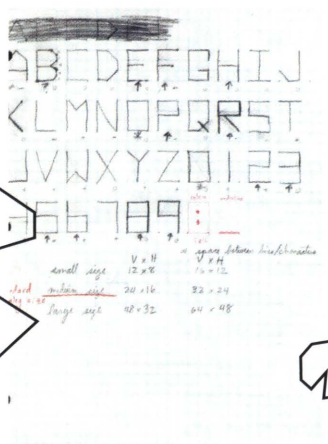
More than 70,000 units were sold, generating revenues of $150m (£97m) for Atari, and no one knows for sure how many coins the rock-splitting diversion sucked up, but Atari estimates it made more than $500m (£323m). Although orders have tapered off, the game's legacy lives on with innumerable arcade, home, and Web-based adaptations. This obsession, close to a quarter of a century old, owes its success to Atari programmer **Ed Logg** and a game that never took off.

From failure comes...

With the success of *Super Breakout*, Logg had established himself as a Super Duper Game Guy (it's the title on his current business card). **Lyle Rains**, the director of Atari's coin-op group, needed Logg's advice. The company was testing a game that featured a giant asteroid which couldn't be destroyed. Yet that didn't deter players. They kept shooting at the rock. According to Logg, "[Rains] felt that if people kept shooting at it maybe they really want to blow up asteroids. He said, 'Well, why don't we have a game where you shoot the rocks and blow them up?'"

However, Logg was looking for a little more strategy. He responded to Rains' suggestion: "I'd really like to shoot the rocks and break them into smaller pieces because that way the player wouldn't shoot everything, he would selectively pick. He doesn't want to just randomly shoot because then you would have too many rocks flying around and it would be

YOUR SCORE IS ONE OF THE TEN BEST
PLEASE ENTER YOUR INITIALS
PUSH ROTATE TO SELECT LETTER
PUSH HYPERSPACE WHEN LETTER IS CORRECT



Logg created his own font using the game's vector graphics, taking care to ensure that certain profane combinations of letters would not register on the hi-score table

too damn dangerous." Logg knew that shooting rocks wouldn't be enough: "You needed to do something, otherwise the player would just fly around and leave one rock on the screen and there's no impetus to get you moving." Having seen flying saucers in the game *Spacewar!*, Logg suggested that they introduce a similar flying saucer to chase the player on to the next round.

The next consideration was the graphics format. "[Rains] wanted it on raster and I suggested XY monitor because it's higher resolution [1,024 x 760 versus raster's 320 x 240] and you need that resolution to see what angle you're shooting at. I was familiar with *Spacewar!*, the original vector game, and so I knew that the high resolution was required." Since Logg was on a streak with great ideas, Rains gave him the green light on XY monitor and everything else. Logg was dubbed *Asteroids*' programmer, project leader and artist. Also present in that first meeting was Howie Delman, who joined as engineer, and then Paul Mancuso joined the team as the game's technician.

Pain-free processing

Although developing coin-op games in the '70s was a laborious process, thanks to the complexity of the 6502 CPU, programming *Asteroids* was surprisingly pain free. The basic underlying routines for the existing XY hardware had already been used in Atari's *Lunar Lander*.

One game element that evolved after the initial *Asteroids* meeting was the division of the big saucer and the small saucer. Logg wanted two saucers with different roles: "The big saucer would come in: 'Shoot me, shoot me… I'm just going to take a few random shots… I'm cannon fodder.'" The small saucer would arrive after three big saucers. Its firing would be more focused than that of the big saucer. Throughout gameplay, the two would randomly switch appearances. Attain a certain score and you'd only see the small saucer. "Once your score got higher and higher the saucer would come in and shoot faster and faster and faster and faster until you reached some maximum limit," says Logg, "[Reach that limit and] the spaceship is probably coming in as fast as he can, he's shooting as fast he can, and there's an angle range that he shoots you at and it slowly decreases until he is extremely accurate." *Asteroids* maxes out in complexity somewhere between 40,000 and 60,000 points. Logg has reached that range and beyond. He's taken the machine to 99,999 points.

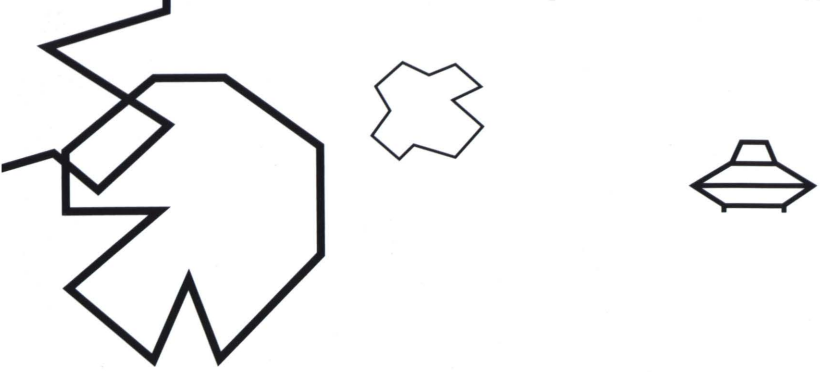
And... success

After only two years of programming games, Logg had already witnessed patterns within Atari that hinted at a game's impending success: "I could tell when late in the project people would come in and bug you: 'Can I play the game now? Can I play the game now?' Or you'd leave for the night, come back and the hi-score table would be full." While all were good indicators, accolades from fellow engineers are rarely good predictors of market performance. The game needed real-world testing, which it got in Sacramento, California. Logg describes the first time he saw a normal person play his game: "First guy just walked up to the game, put a quarter in and died instantly. It must have been a 15-second game. And he turned around and put another quarter in. And for me that was like, 'Okay, I know now that this game is okay.' Usually when people die after 15 seconds they say, 'Oh shit, the game's too hard,' and walk away. But in this case, it was clear to me that the player said, 'I screwed up, I can do better.' And that's what you want to see in a game."

Experts wanted to lurk and show off. Others wanted to imitate the masters and learn to lurk. No one knows for sure, but lurking may have been the factor that kept the game in play for so long

The lure of the lurk

"The initial game design was set up so that as soon as the saucer came in he would take a shot," says Logg. "And most people would hear the saucer sound first, and try to locate him. By this time of course the saucer has already taken a shot and if you



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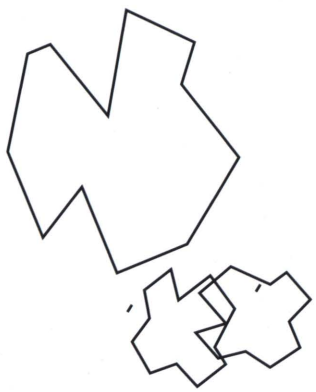


weren't paying attention or unlucky he could nail you before you even had a chance to do anything. So it was felt, and I agreed, that the saucer had to wait a little while before he took a shot at you. This opened the doors to the whole lurking strategy." Logg wasn't too concerned, since he tried to master lurking and was unsuccessful, so he felt nobody could do it. But that 'delay before firing' did result in the development of lurking, and Logg finally figured out how to do it himself.

Players used lurking to impress their friends. Operators started to complain about lost revenue. In response, Logg and his team created a new 'lurk-limiting' EPROM (Erasable Programmable Read-Only Module) to replace the old one. *Asteroids* fans soon realised that some machines were harder than others. If they came upon a machine with the new lurking-disabled EPROM, they'd move on to another machine. Experts wanted to lurk and show off. Others wanted to imitate the masters and learn how to lurk. No one knows for sure, but lurking may have been the factor that kept the game in play for such a long time.

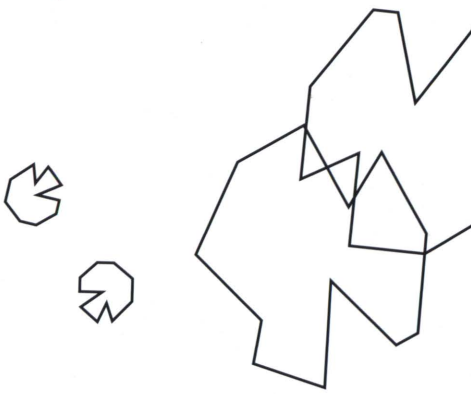
The extra-life crash

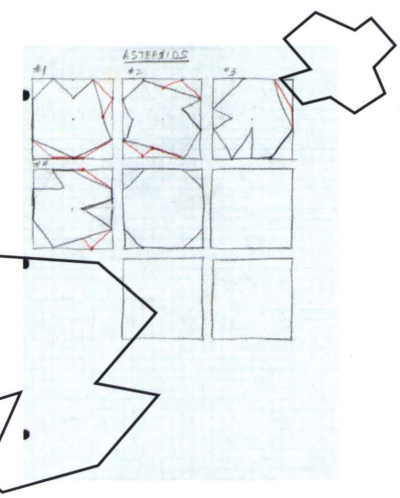
Get good enough at *Asteroids* and the game slows down; Logg had no idea that players were going to cap his resources. It's a programming error that Logg admits to: "I should have limited the number of the player spaceships to ten or something. But I drew so many across the top of the screen and I kept drawing them off the edge of the screen that the game actually slowed down." Build 50 to 100 lives and the game will begin to crawl.

Collect more than 250 lives and you may lose your game. It's the fault of the machine's watchdog circuit. To stay operational, coin-operated arcade units need a periodic response from the program. The watchdog circuit tells the machine that the game is still working. If too much time passes and the program doesn't receive a response, the watchdog circuit will think the game's dead and it will reboot.

Logg definitely yearns for the earlier days of game developing where he only dealt with one or two people instead of 30 and it only took a few weeks instead of a year and a half to develop a prototype. He still develops games today with the same group of developers from the late '70s – now known as Midway Games West. At the end of this year, the team will release *Dr Muto*, a character-based action adventure game for the PS2, Xbox, and GameCube.

Asteroids has been a major part of Logg's life. He used to play the game in his sleep. When he mentions it to people, he often gets the response, "Oh, so you're responsible for all my lost milk money." Logg, however, doesn't accept responsibility. That's not to say he wouldn't give *Asteroids* credit for his marriage: in an odd twist, before he ever met his wife, she already owned a coin-op *Asteroids* in her home.





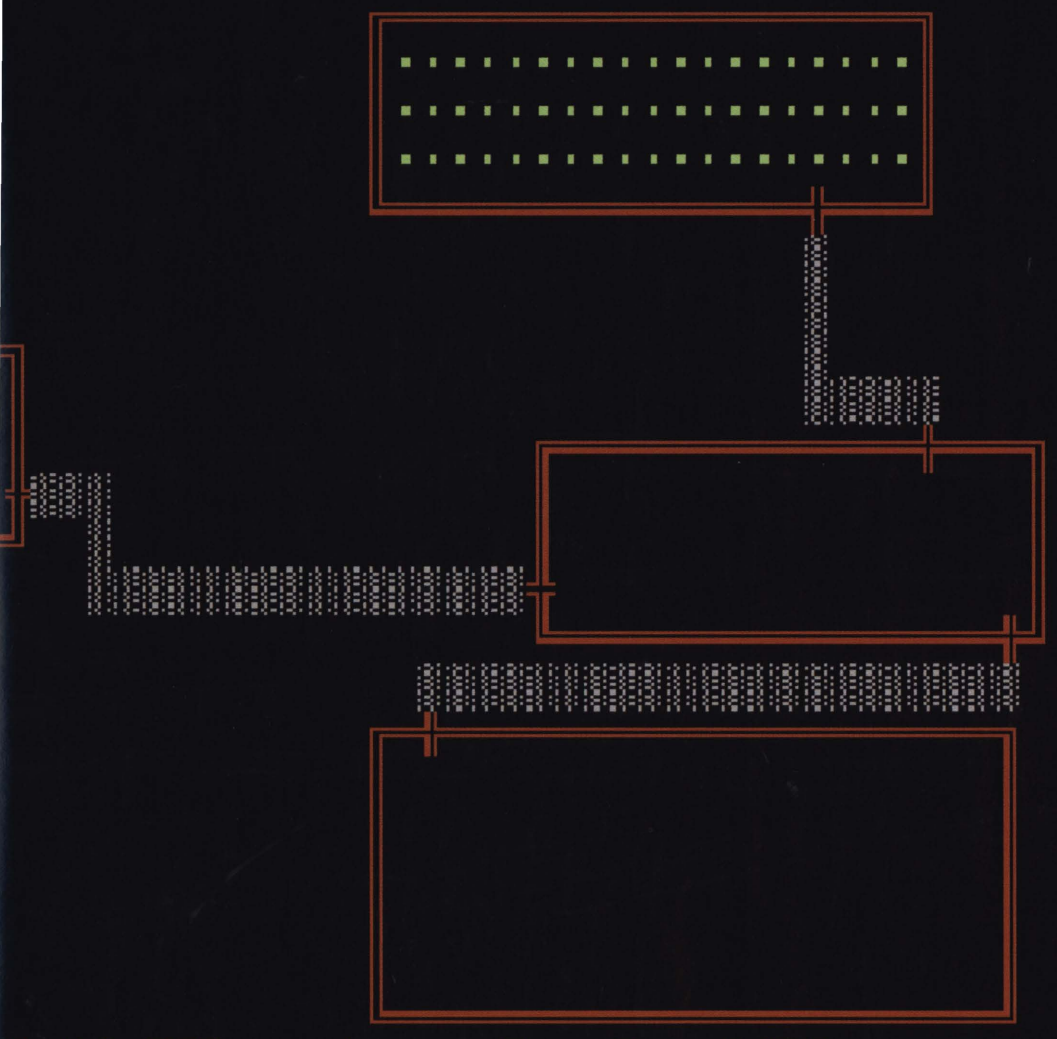
Yes, early art design really was this basic. Although the concept was simple, the extra level of strategy introduced when asteroids split apart made Logg's game compulsive

GAME OVER

Rogue

You were represented by an '@' symbol, your enemies took the form of capital letters, and it was near-impossible to complete – but *Rogue* is one of the most influential games ever. **Edge** talks to its creators

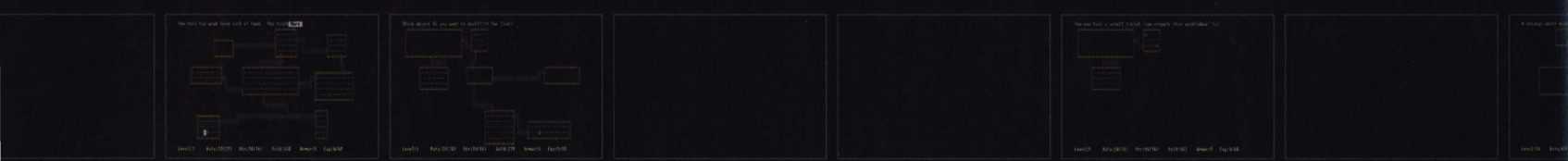
Original format: **BSD 4.2 UNIX**
Publisher: **n/a**
Developer: **Ken Arnold and Michael Toy**
Origin: **US**
Release date: **1980**



Hello Edge, Welcome to the Dungeons of Doom." To anyone familiar with a game that was to go on to have an almost disproportionate historic significance, and that is still enjoyed by countless gamers today, these innocuous and almost unreasonably cheerful words have an almost mythic resonance. They signalled the beginning of a legendary quest to recover the fabled Amulet of Yendor from a monster-ridden dungeon. Back in 1980, when the original version of *Rogue* was included in the 4.2 version of BSD UNIX, arcades were home to the likes of *Pac-Man*, *Space Invaders*, and *Asteroids*, while the university computers on which the game was created were capable only of games like *Boggle*, *Quiz*, or the influential text-based *Adventure*.

Against this background, it was an ASCII graphical breakthrough that was ultimately responsible for the genesis of *Rogue*, but if it wasn't for its hypnotically beguiling gameplay the title is unlikely to have had quite such an impact. "Two things made me think that this game could be a commercial success," notes **Jon Lane**, who coded the PC version of the game in 1984. "The first was that when I was running a network-wide analysis of system usage we found that *Rogue* was burning more CPU cycles than anything else. The second was that Dennis Richie, of UNIX fame, was quoted as saying that *Rogue* wasted more CPU time than anything in history." Certainly the legacy of the game is immense. *Diablo* clones are little more than graphical updates, and ASCII RPGs are still popular, with *Nethack* in particular currently being championed by the open-source community.

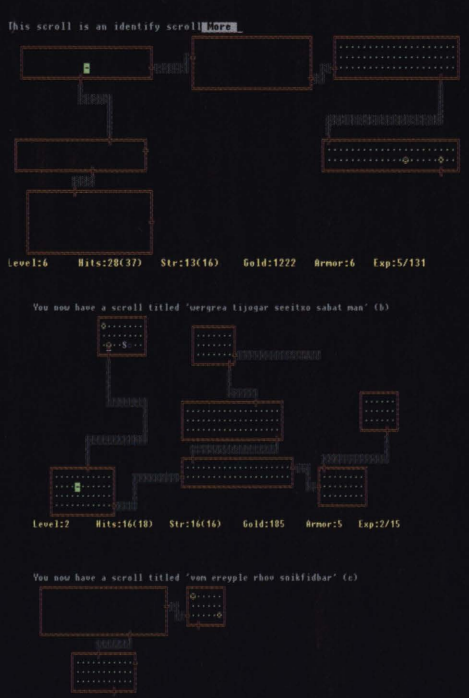
The origins of *Rogue* start with **Glenn Wichman** and **Michael Toy**. "Glenn and I were pounding away at keyboards on the UNIX timesharing system at UC Santa Cruz," remembers Toy. "This was around



1980, and *Rogue* ran in something like 128K of memory, which was an order of magnitude more than any personal computer had. We were theoretically supposed to be attending classes and earning a degree, but instead we spent most of our programming for fun." Wichman agrees: "Michael and I were 19 when we designed *Rogue*, so we hadn't done much in life yet. I was meandering through university, trying to decide what to major in. I had never used a computer before arriving at university."

Around this time, the development of a library of routines by Berkeley student Ken Arnold allowing 'cursor addressing' made it possible to use text characters and symbols to create rudimentary graphics. Which is exactly what Wichman and Toy did. "We were both big fans of *Adventure*," recalls Wichman, "and we were musing about whether we could do a graphic *Adventure*-like game. I didn't think it would be possible, but then Michael came up with the overhead map view idea, and it all started to fall into place." Eventually, Toy was to transfer to Berkeley, where he met up with Arnold, and they completed the initial version of *Rogue*.

Despite the continued success of *Rogue*-style games, the title does have its critics. "My kids are fairly unimpressed," notes Ken Arnold. "Which is good – what are parents for if not to give their children something to sneer at?"



Apart from *Adventure*, the other obvious source of inspiration was Dungeons & Dragons. "In the very first version, the monsters and their strengths and abilities were very closely modelled on Dungeons & Dragons," explains Wichman, "but we quickly changed this to avoid getting in trouble with Gygax and Arneson." The game itself involves exploring dungeons, which were depicted via ASCII graphics from an overhead view, with your character, represented by an '@' symbol, fighting monsters, shown as capital letters, and ultimately retrieving the Amulet of Yendor. "The Amulet of Yendor is simply Rodney spelled backwards and I guess that seemed funny even though Rodney was no one in particular," reveals Lane.

The game's chief appeal is that the competition between the need to eat, the need to explore and

acquire items, and the need to penetrate deeper levels of the Dungeons of Doom achieves such a delicate balance that it engenders a state of deep play. The geometry of exploration, in particular, is as psychologically compelling as, for example, the falling blocks of *Tetris*. "I think there is a rate of change and exposure to new elements that is seductive," notes Arnold. "You could get into a mode of movement that was nearly hypnotic, and keystrokes changed the screen a bit, so the world was successively revealed to you – continuous change within a pattern." Along the way, malevolent entities such as Aquators, with their ability to weaken armour, or Quaggas, whose chief characteristic is that their name began with a 'Q', hinder progress. And woe betide any player that receives the much-feared 'A cloak of darkness falls around you' message early in the game.

As is so often the case, the real achievement of *Rogue* rested on a little bit of technical ingenuity, a little bit of creativity, and a little bit of luck. When questioned about the balance that the game's creators managed to pull off, Wichman is modest: "I think we mostly got lucky. We did do some balancing in terms of what level monsters would show up. Trolls originally showed up pretty early, and would always kill you, so we moved them down a few levels." Or as Arnold puts it: "We didn't so much design the game as discover it." And while devotees of the game would argue otherwise, Toy points out that the game could have been better. "Our vision was for the creatures to be more than the stupid robots they turned out to be, for them to have life and intelligence, each one with different attributes. We never really were able to do much with that. The initial wooden attempts at making the characters interesting was sort of a placeholder for the real thing, but then the game got so popular we never got around to finishing that up."

One of *Rogue*'s biggest innovations – apart from its newfangled graphical sheen, of course – was that each foray into the Dungeons of Doom was randomly generated. "The sad discovery for authors of text-style adventures," notes Toy, "is that it is not that fun to play your own game. You already know all the solutions to the puzzles. The greatest part of *Rogue*, and the part I still wish for as I look at the gaming scene today, is that it made a new world every time. The game was just as hard to win the second time as the first. The worst legacy of *Rogue* is that it is the first of a generation of games where your job is to run and around and kill everything that moves."

As Wichman explains, though, despite random generation, each game is coherent and structured: "The computer itself created the adventure in a random way, but playing it never felt random. You were convinced that the computer nefariously planned to tempt you with cursed plate mail just as you entered Aquator territory." In order to get this right there were obviously obstacles to overcome. "We had trouble coming up with a room-drawing algorithm," recollects Wichman. "We originally wanted something very freeform, where a room could be anywhere, and there could be any number of rooms. We couldn't figure out how to do it. We ended up settling on a nine-room tic-tac-toe grid. Then there was the 'mars bug' – sometimes rooms just would not connect. It took us a long time to figure that one out, and we ended up with a number of frustrated players who were having great games and suddenly could not go to the next level because there was no way to get to the staircase."

Rogue was also ahead of the times when it came to copy protection. Although Codemasters has recently trumpeted the success of novel anti-piracy measures in the most recent version of *LMA Manager*, it turns out that the PC version of *Rogue* beat it by some 15 years. "The first release would randomly cause bit rot," explains Lane, "but as I got a little more clever I just added code that increased the damage and strength of anything evil in the game. It would be a challenge to get past the third level, and the message on the headstone at the end would read '[Your name] was killed by the copy protection mafia'."

Even without a pirated copy the game was hard to beat. "I personally know probably a half-dozen people who completed the game without taking advantage of a bug," reveals Wichman. "By the way, I am not one of those people – I've never even come close to beating the game, even though I understand its workings as well as anybody does. My wife has beaten it."

> "I personally know probably a half-dozen people who completed the game without taking advantage of a bug – I am not one of them"

An example of the way in which *Rogue* exerted its influence far beyond the narrow confines of the videogame industry is that one group of enterprising programmers actually published a paper for 'Scientific American', giving details of a program that played the game. Another incident, remembered by Toy, saw further academic recognition: "One professor at Berkeley used the source code to illustrate how the internals of an operating system work, with all the little entities moving around, slaved to the ticking of a clock [in *Rogue*'s case the clock tick was a key press]." And it wasn't just the experts. "I remember running into a ten-year-old boy in the computer lab," adds Wichman, "who claimed that he had created *Rogue*. I just told him that was cool, and let him tell me all about how he did it."

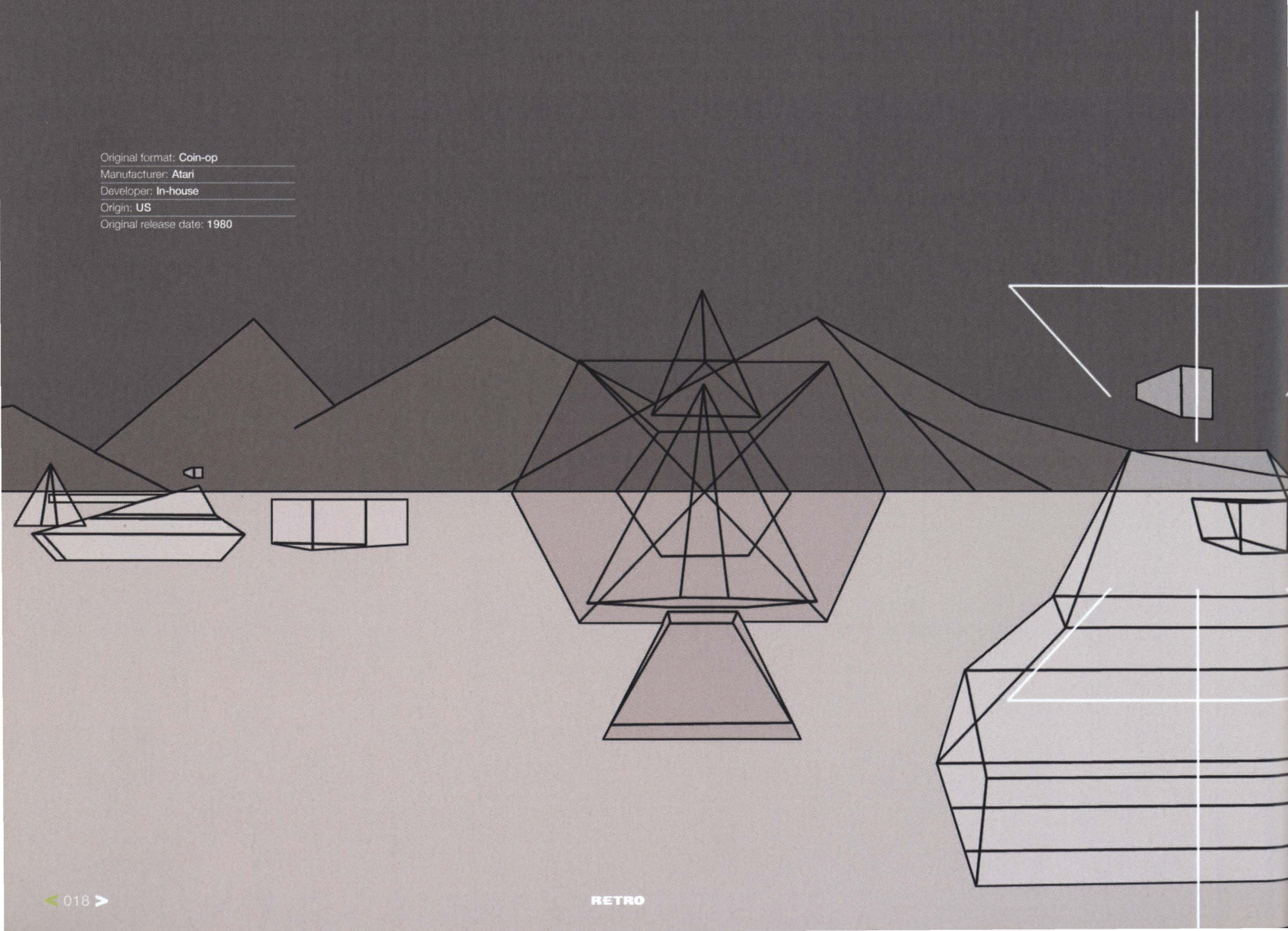
Rogue turned out to be much more than just a diverting hobby for the creators of the game, too. All of those involved in its creation went on to jobs in the then-fledgling IT industry. Ken Arnold ended up at JavaSoft; Michael Toy went on to work at Netscape; Glenn Wichman worked at Intuit, after working on one of the *Mavis Beacon* titles; and Jon Lane started his own company, The Code Dogs. When Arnold sums up the appeal of the game, he is quick to point out that it was a good advert for his curses library that made the game possible: "I think the main achievement was really conceptual – that a randomly generated game was possible and engaging. Technically it didn't do much innovative. It had a slightly wry sense of humour and a different game each time. It did introduce many people to the idea of curses, which was innovative, and I'm sure that the success of curses was helped a lot by the association and demonstration that *Rogue* provided." For Wichman, the impact was perhaps more profound: "Because I did not have a computer degree – indeed, I'd never even taken a computer class – *Rogue* was my CV. It was initially all I had to show to prove that I knew how to program computers; fortunately, in those days it was enough."

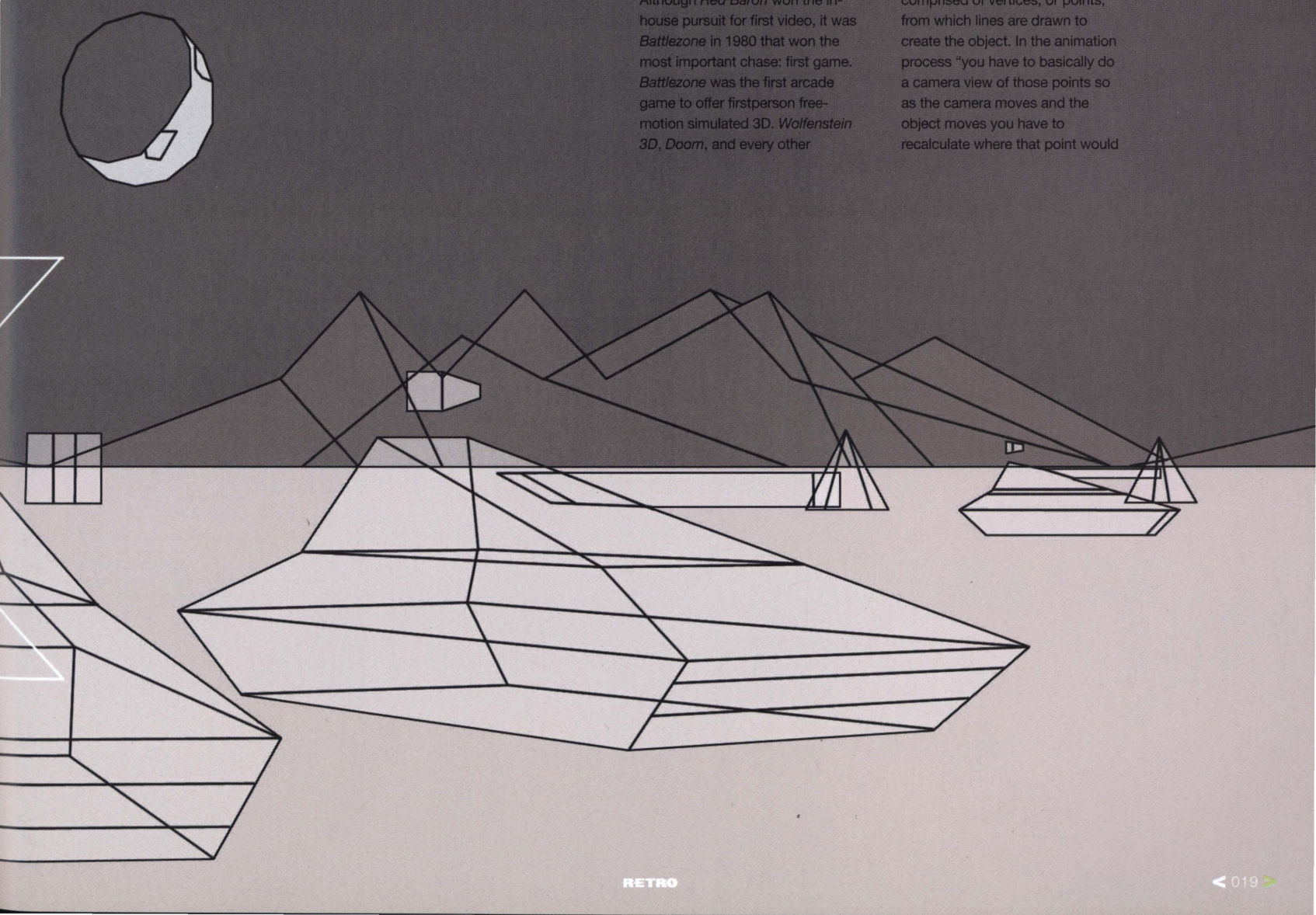
Apt words indeed, since, for those who succumbed to *Rogue*'s subtle charms, it was often more than enough. Perhaps the most telling anecdote is one remembered by Toy: "It was an interesting lesson in human psychology to sit in a room and listen to people playing *Rogue*. People came up with the wildest theories about how the game worked, actually attributing more intelligence to the little monsters than they actually had – sort of filling in the blank spaces, making the world richer by adding their own imagination. Some people even hit the keys harder, because they thought they had figured out that their attacks did more damage that way..."

Battlezone

In 1980, Atari went to war. Far from being a traditional conflict, however, this battle was played out against a stark alien backdrop. **Edge** goes back to the front line

Original format: **Coin-op**
Manufacturer: **Atari**
Developer: **In-house**
Origin: **US**
Original release date: **1980**





The thing started out as pretty much an experiment," recalls **Ed Rotberg**, lead programmer on Atari's *Battlezone*. "We actually started two projects at the same time to try to do firstperson 3D games. The other one was *Red Baron*."

That experiment turned into a competition. In a race between a futuristic tank and a WWI biplane, who would be first to develop a game with 3D vector technology? Although *Red Baron* won the in-house pursuit for first video, it was *Battlezone* in 1980 that won the most important chase: first game. *Battlezone* was the first arcade game to offer firstperson free-motion simulated 3D. *Wolfenstein 3D*, *Doom*, and every other firstperson shooter owes its legacy to Rotberg's game.

The 3D cheat

In 1980, Atari had just released its best-selling game, *Asteroids*, which used vector technology. Vector was a goldmine. Atari wanted to dig deeper. So engineer Jed Margolin developed quasi-3D algorithms to put the potential of a firstperson 3D vector experience within sight. 3D vector objects are comprised of vertices, or points, from which lines are drawn to create the object. In the animation process "you have to basically do a camera view of those points so as the camera moves and the object moves you have to recalculate where that point would

appear when projected on the screen, and then you have to draw the lines between the points," explains Rotberg. All that calculation takes processing power, and Rotberg was working with a 6502. To make the animation work, the number of vertices had to be low. So Rotberg asked Roger Hector, an artist at Atari, if he could come up with some orthographic 3D drawings of a tank with few vertices. With no computer-based 3D design tool available, Hector drew the tanks on paper for Rotberg to code.

"Every day Owen would come in and say, 'When are you going to make the volcano active?' I said, 'If you want it active, damn well do it yourself'"

Even with Hector's simplified tanks, Rotberg still couldn't pull off full 3D animation with the 6502: "The biggest bugaboo of course was how to squeeze the most performance out of this technology. You were trying to figure out what tricks – how can I cut corners, how can I make this display, this system more capable than it really is." After much thinking, Rotberg generated his own flavour of simulated 3D: "All the motion was on a plane. Not much really moved in three dimensions. The pieces of the explosion and the missile were the only thing that moved in true three-dimension. But they didn't rotate in three-dimension so we were able to cheat on the math a little bit. Nothing in the game rotated other than around the up-and-down axis." The single-axis decision was the biggest cheat of all. It allowed Rotberg to drop the calculation playfield from a 3x3 to a 2x2 matrix. With the rules of the *Battlezone* universe set, Rotberg made a tank and dropped it on the playfield along with some cubes and pyramids. He then created a simple pyramid shell and started firing it around. It looked good, but this was *Future Tank* (the working name for *Battlezone*); what else could he throw out there?

Buzzing bombs

The buzz bomb or missile is a projectile that moves directly at the player. First one comes right at you, with no evasive manoeuvres,

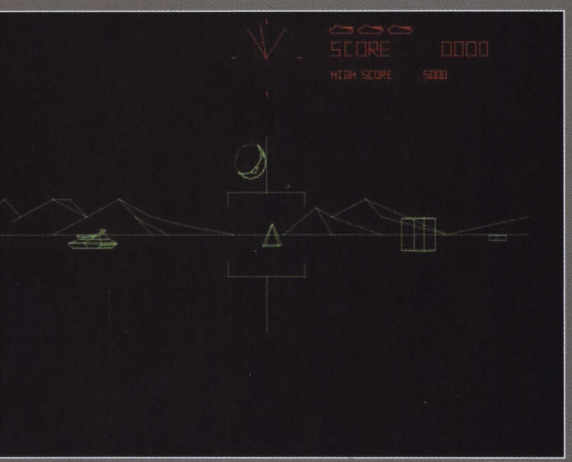
no dodging. "From then on it would start an evasive manoeuvre that was like an algorithmic zigzag. After doing that for a while it would then come straight at you," says Rotberg. Get good enough and the buzz bomb would never come straight at you, it would just zigzag. Learning how to deal with the missile, its movement, and how to lead your shot to nail it was one of Rotberg's favourite parts of *Battlezone*. But the game wasn't always about straightforward aggression: "We wanted to kind of distract the player to make it easier for the opponent to pick him off. And so we put a juicy flying saucer out there. It's risk/reward. You can go after it, but it's kind of a sucker shot. You know if you go after it you're not paying attention to someone chasing you and it makes it easier for the rather limited AI to lock in on you and kill you." The flying saucer's movement is entirely random – unlike *Battlezone*'s various other enemies, it has no artificial intelligence.

Battlezone's AI is simplistic and progressive. In the beginning of the game, the tank waits a certain amount of time and then looks for the player. After it sees where you are, it turns toward you, drives toward you and then shoots you. Shoot enough enemies and the tank's non-seeking grace period disappears – your enemy begins hunting you the second it appears. The regular tank and the super tank have exactly the same AI; the two differ only in that the super tank can turn and move faster. Battle on to the later rounds and the regular tanks vanish, leaving only super tanks.

A volcanic eruption

Battlezone is an endless universe. It may not seem so since one can see a background of volcanic mountains. But they're unreachable. That didn't matter to *Battlezone* players. They wanted to reach them, hoping to find some new world. And one did – or so he thought. Atari received a letter from a player that said his friend reached the volcano, climbed into the crater and explored a castle. (Don't bother searching because it's not there.) The volcanoes, drawn by Roger Hector, were intended to be inactive. But Owen Rubin, a fellow Atari programmer, kept bugging Rotberg to make the volcano active. "Every day we were

Despite its 3D appearance, *Battlezone* cheated in that nearly everything existed on a single plane. The game's horizon could never be reached – but that didn't stop players from trying, one even claiming to have reached the volcano and climbed inside it



Battlezone's playing environment was stark, chiefly because of its limited processing power. Nevertheless, the vector minimalism helped to build an otherwordly, alien feel

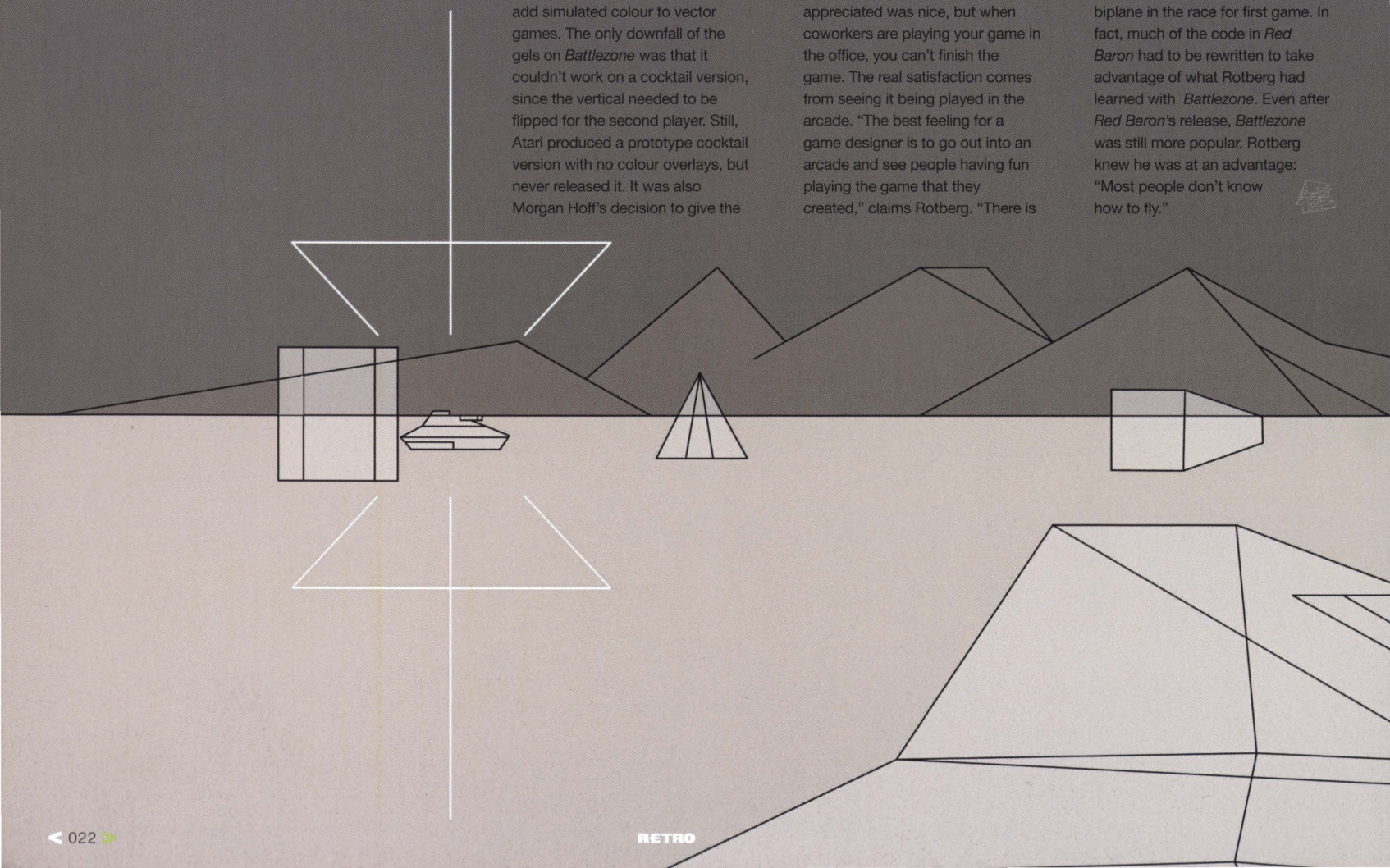
working in the same lab and he'd come in and say, 'When are you going to make the volcano active?'" recalls Rotberg. "I was trying to get the game to work. And I said to him, 'Owen, if you want the volcano active you can damn well do it yourself.' And so I came into work one morning and there sitting on my chair was a listing with code for making the volcano active. So I slapped it in and we had an active volcano."

Morgan Hoff, the project leader on *Battlezone* and the man who appointed Rotberg to the project, was responsible for adding a little low-tech flair to the arcade unit. It was his idea to add the green cellophane gel over the play area and the orange gel over the radar. This wasn't new given that Cinematronix, a major leader in vector games at the time, had already been playing with gels to add simulated colour to vector games. The only downfall of the gels on *Battlezone* was that it couldn't work on a cocktail version, since the vertical needed to be flipped for the second player. Still, Atari produced a prototype cocktail version with no colour overlays, but never released it. It was also Morgan Hoff's decision to give the player a scope – a feature to which Rotberg had conflicting feelings: "I didn't mind the scope for the player and I thought it was pretty cool. [But] part of what made games in those days attractive and popular and what got large numbers of people excited about a game was not only playing it yourself but watching other people play it – seeing what they're doing. You would go into the arcades and you'd see huge groups standing around someone playing *Pac-Man* or *Asteroids* or *Missile Command*. With that scope version of *Battlezone*, you really couldn't do that. It precluded that. And that's why later versions did not have that."

Success and the Army

As *Battlezone* took shape, engineers in the lab wanted to play it – a lot. In-house success at Atari has always been a good barometer for market success: being appreciated was nice, but when coworkers are playing your game in the office, you can't finish the game. The real satisfaction comes from seeing it being played in the arcade. "The best feeling for a game designer is to go out into an arcade and see people having fun playing the game that they created," claims Rotberg. "There is nothing better than that. To walk around and see all the other games, and know that people can choose from anything in there, but they are playing your game. That is pretty heavy stuff." The game was so successful that the US Army wanted Atari to make a version of the game to train its troops. It was a project that Rotberg begrudgingly did with the reassurance that he'd never have to work on another one again. Although he hated the months of 12- to 16-hour days, Rotberg successfully pushed the military version of *Battlezone* from a simulated 3D to full 3D.

Rotberg loved *Battlezone*'s ability to suspend reality: "For a while people could actually believe that they were manipulating something on a foreign world, on an alien world. That is absolutely where we were trying to go." In the end, the futuristic tank beat the biplane in the race for first game. In fact, much of the code in *Red Baron* had to be rewritten to take advantage of what Rotberg had learned with *Battlezone*. Even after *Red Baron*'s release, *Battlezone* was still more popular. Rotberg knew he was at an advantage: "Most people don't know how to fly."



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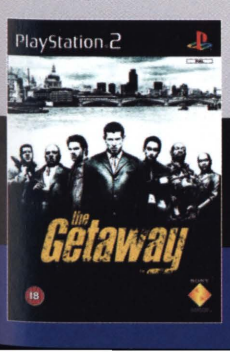
Getting away in London!



This is the Getaway. Over 28 square miles of London's streets, motors, drug dens, strip clubs, criminals and guns, captured in perfect detail. Ready to see the sights?

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THE PARANOIA PLACE THE SADISTIC PLACE THE HOSTILE PLACE

PlayStation 2 THE THIRD PLACE


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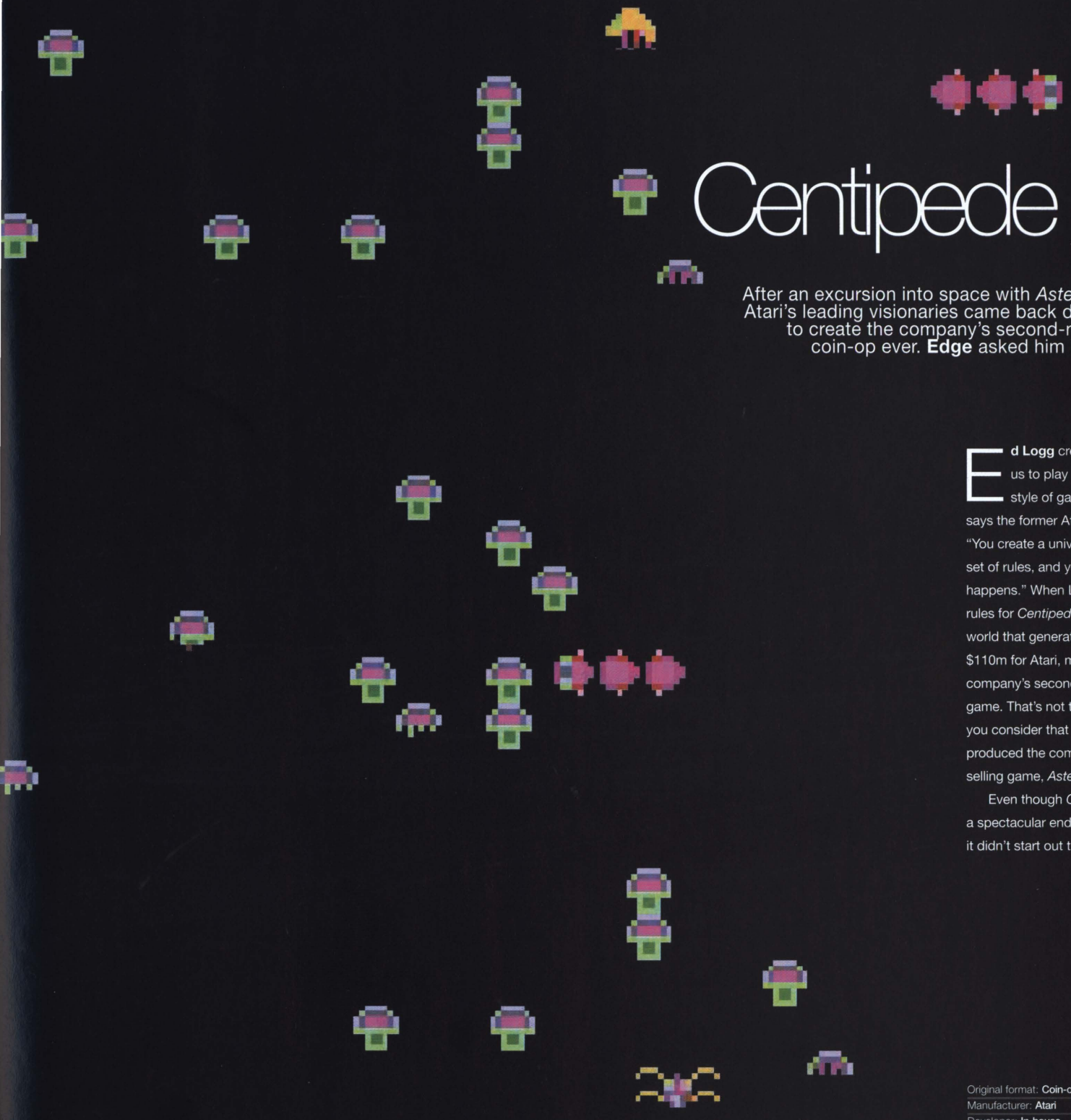

Centipede

After an excursion into space with *Asteroids*, one of Atari's leading visionaries came back down to earth to create the company's second-most-popular coin-op ever. **Edge** asked him how he did it

Ed Logg creates worlds for us to play in. "That's my style of game development," says the former Atari programmer. "You create a universe, you set your set of rules, and you see what happens." When Logg created the rules for *Centipede*, it resulted in a world that generated more than $110m for Atari, making it the company's second-biggest-selling game. That's not too bad when you consider that Logg also produced the company's best-selling game, *Asteroids*.

Even though *Centipede* had a spectacular end result, however, it didn't start out that way. The

Original format: **Coin-op**
Manufacturer: **Atari**
Developer: **In-house**
Origin: **US**
Release date: **1980**

Find an early cocktail *Centipede* and grab the player two position for a significantly easier game

Centipede clones commonly use joysticks, but the original's trackball made a big difference

SO ATARI

idea for the game came from a brainstorming session that Logg didn't even attend.

The Centipede universe

Every year, Atari held a creative roundtable to produce a book of ideas. After the meeting, Logg took a look at the book and saw a one-paragraph description of a game called *Bug Shooter* or *Shoot the Centipede*. It was all the inspiration he needed to begin creating his *Centipede* universe.

The first issue in the game universe was orientation. Logg didn't want to repeat the omni-directional shooting of *Asteroids*, so he decided to set the monitor on its side, like *Galaxian*, in order to give himself the most vertical room. But unlike *Galaxian*, he wanted some limited vertical movement. He arbitrarily picked the bottom fifth of the screen and for control opted for a mini trackball instead of a joystick. "I wanted to have variable speed," he says. "I wanted you to be able to dodge things quickly as well as have very fine control."

In each wave, the centipede winds its way down, reversing its direction every time it hits a mushroom. With each turn, the threat gets closer and closer to the player. To avoid impending doom, the player must shoot all the segments of the centipede to move on to the next wave. Shoot a segment within the body and the centipede breaks in half like the rocks in *Asteroids*, becoming two independent centipedes, and doubling the threat.

With yet another tip of the hat to his previous success, Logg gave *Centipede* a spider to play the same role the flying saucer did in *Asteroids*. "It was a way of keeping you from just sitting in one place and generating unpredictability. [It was] another sense of imminent threat from a different direction… And despite what everybody might say," Logg notes, "[The spider] is not intelligent, it doesn't go jump on you, it just randomly chose a direction. So despite your best efforts, it is just randomly picking directions every so often. It makes no attempt to even look at you, [to] find out where you are or what you're doing."

The randomly moving spider was so effective that Logg didn't even need the grasshopper (yet another enemy to keep players moving). Unlike the randomly seeking spider, the grasshopper sought you out by jumping around. If you kept moving, you could avoid it. Logg programmed the animation for the grasshopper, but never implemented it in the game. "It turned out the spider was enough of a problem that you didn't need any more headaches," he explains. Diehard fans can still see the grasshopper in the arcade unit's test mode.

Mushrooms and fleas

Logg admits that the first *Centipede* build wasn't all that fun. Mushrooms were static and indestructible, and the player area was free of their impediments. But all that changed when a colleague complained, "Why can't I shoot the mushrooms?" It was an idea that got Logg thinking: "Well, if I shoot the mushrooms I've got to have something to put the mushrooms back."

To increase fungi on the screen, Logg decided that shot centipede segments would become mushrooms. With that rule change, mushrooms could now appear in the player area. But he needed more. They were vanishing too quickly. Players could shoot the mushrooms and if the spider jumped on them, they'd disappear. Logg needed a way of leaving mushrooms randomly, especially in the player area, so he introduced the fleas. If mushrooms in the player area fell below a certain range, the centipede would send fleas to drop a few more.

The creation and destruction of the mushrooms turned the screen into a constantly changing playfield. "Once we started shooting mushrooms it became extremely fun," relates Logg. The game added a new strategy dynamic where the mushrooms could be a help and a nuisance. If you planned well, you could control the movement of the centipede. If you let them build up in your player area, then they could get in your way.

Scorpions

Centipede was exciting, but Logg feared that the game would get boring for hardcore players. He wanted to devise a method of getting all the segments to the bottom of the screen at once to create an immediate threat. So he introduced the scorpion, a bug that would travel horizontally across the screen, poisoning all the mushrooms in its path. If a centipede hit a poisonous mushroom, it would drop straight to the bottom of the screen.

In *Asteroids*, players racked up points by preventing the game from moving on to the next wave. They left a single rock floating on the screen and lurked for flying saucers. To thwart players from lurking in *Centipede*, Logg wouldn't let you leave a single centipede segment on screen. If you did, he'd bring in extra centipede segments from the bottom. The base-appearing segments became so frequent that it made lurking impossible and usually resulted in the player's death.

Conquering the universe

This cast of characters became the *Centipede* universe – a universe defined by a set of rules where there are benefits and consequences. "A lot of times you get the consequences where it's way too easy," says Logg. "You set up some more rules so that doesn't happen. And then it becomes maybe too hard. Okay, ease back. You try to find a set of rules such that it's rich and it allows you all sorts of variety." It's been Logg's style of game development to this day. Once he hits the sweet spot he lets the game universe play itself out.

And that's when the unforeseen strategies of defeating the universe come about. The most common in *Centipede* was the column strategy where the player would clear a column, and shoot all the centipedes as they ran down. Logg predicted this technique and actually saw the fleas helping achieve it. Unfortunately for players, the column strategy was not perfect.

A more impressive and fascinating technique was the blob strategy. Under blob, you shoot all the mushrooms at the top of the screen, keeping it clear, and then leave a huge thick blob of mushrooms right above the player area. That way, it takes forever for the centipede to zigzag its way down, leaving you lots of time to shoot spiders. Blob isn't easy and requires heavy planning in the early waves. As a player, Logg could never pull it off.

There was one perfect strategy that did successfully defeat the *Centipede* universe. It is a method in which three mushrooms spaced one row apart are positioned in the second column on the left or right hand side in the player area. With such placement, the centipede segments become trapped forever, giving you all the time to snipe

"Despite what people say, the spider is not intelligent. It doesn't try to jump on you, it just moves about randomly"

spiders. All the player has to do is make sure he shoots the spider before it eats the mushrooms.

A bug in the cocktail

Some claim the three-mushroom technique is a bug, but Logg just sees it as players learning how to defeat the universe. He did have one bug that he didn't see until a few years after the game's release. Logg noticed that on the cocktail version, players would choose the second player. When he asked why, they responded, "Oh, it's easier." It's easier because one enemy doesn't behave the same when you're the second player. As waves increase in *Centipede*, the area where the spider bounces around becomes smaller and smaller. When Logg flipped the vertical for the second player on the cocktail version, he didn't flip the rules for the spider. So instead of getting smaller and smaller, the spider's movements got larger and larger. The bug was never corrected. So if you have the cocktail version and want an easier game, play as the second player.

Girl gaming

Like *Ms. Pac Man*, *Centipede* was a big hit with women. Critics attribute the popularity to the touch of Logg's assistant programmer, Dona Bailey. Logg was her supervisor, and assigned her to the project – her first ever. She did various programming, including picking out the colours for the mushrooms. She is attributed with being the first ever female computer game programmer.

Centipede was also popular with Logg's wife, who still plays it today. The game was such a huge hit that Logg created a sequel, *Millipede*, in 1983. The game generated $21m in revenue for Atari.

Combine that with the $110m *Centipede* made and it could be said that Ed Logg is the world's most successful exterminator.

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Not just an ordinary girl...
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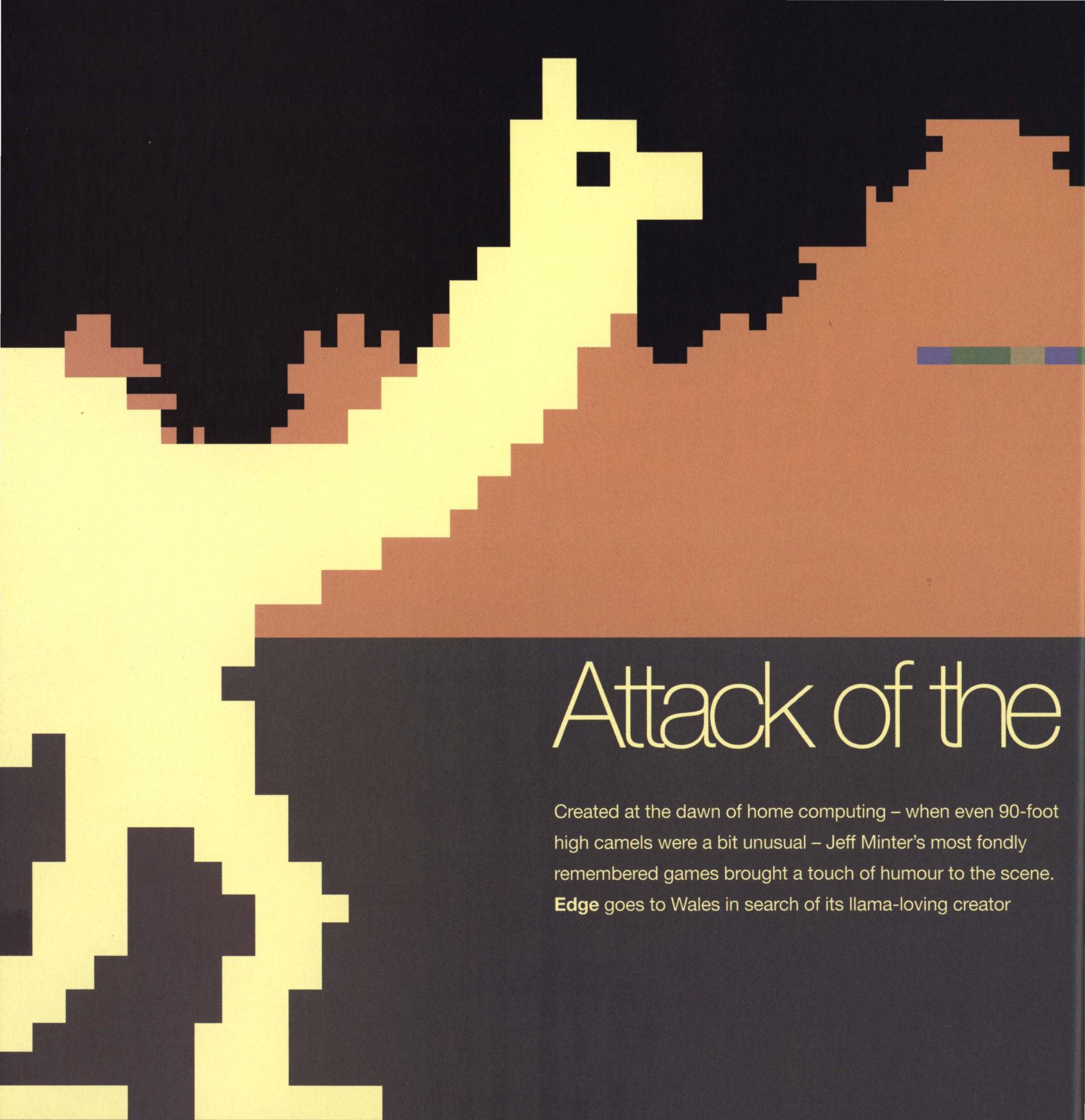
PlayStation 2

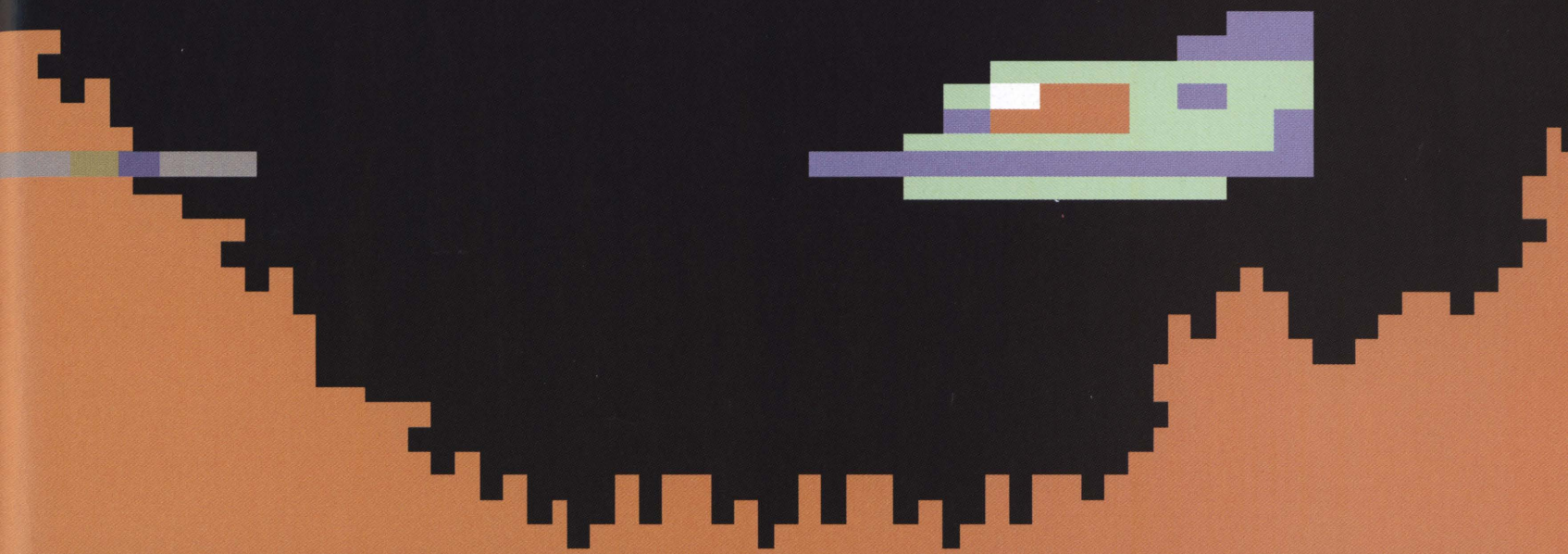
THE DEMONIC PLACE THE IMMORTAL PLACE THE THIRD PLACE



Attack of the

Created at the dawn of home computing – when even 90-foot high camels were a bit unusual – Jeff Minter's most fondly remembered games brought a touch of humour to the scene. **Edge** goes to Wales in search of its llama-loving creator

Original format: **Commodore 64**
Publisher: **Llamasoft**
Developer: **Jeff Minter**
Origin: **UK**
Release date: **1983**



Mutant Camels

Any knowledgeable fan of the 'Star Wars' films will tell you that the mighty science fiction saga has inspired its fair share of bizarre cultural artefacts. Some are close homages, some are parodies, and others are more laterally stimulated by some aspect of George Lucas' mythos. Surely one of the most surreal examples falls into this latter category and appeared almost 20 years ago: the classic videogame that was *Attack of the Mutant Camels*.

AMC was released in 1983 for the old beige warhorse, the 8bit Commodore 64. It was produced by **Jeff Minter**, known to his friends, colleagues and fans as 'the Yak' of 49 Mount Pleasant, Tadley, England. Fans knew this was his address because it was printed, endearingly, on the reverse of every copy of the *AMC* cassette box and was the epicentre of the mighty Llamasoft software production house (and the address certainly gives you the impression that it probably was just that: a house).

Minter had been inspired to create *Attack of the Mutant Camels* after reading a magazine review of the Parker Brothers' version of *The Empire Strikes Back*. That game was a console-based take on the famous AT-AT attack sequence from the second film in the original space fantasy trilogy. The review in question described the Walkers as 'giant mechanical camels.'

"And that just got me thinking about giant camels in general," says Minter. "Normal camels aren't that big, and so if they weren't to be robot camels then they must need to be mutant camels. And thus was born a very silly game sequence indeed."

Minter had learned game programming in order to amuse his mates at college at a time when there wasn't really any commercial application for it. It was a couple of years later, while recovering from a serious illness, that he decided to try and sell some games.

"Going through college I had always been on a maths and physics track," he explains. "I also had an A-level in English, which was kind of an odd combination. I think I enjoyed programming so much because it embodies both the logical discipline of the scientific side of things and the ability to create whatever the hell you like from the artistic side of things."

Ideal niche

Interestingly, given that his games are renowned for their imaginative, often psychedelic visuals, Minter claims little in the way of artistic prowess: "I was never good enough at drawing to get into animation or anything like that. I guess in programming I found my ideal niche, because if you can't draw you can make it up algorithmically."

The *AMC* plot involved you having to pilot your tiny but highly (well, moderately at any rate) manoeuvrable fighter craft across a scrolling, mountainous alien landscape

Attack of the Mutant Camels had you facing relentlessly marching 90-foot tall laser-spitting camels of death. Minter: "My aim is to create fun games, unpretentious games"

and against 90-foot high, neutronium-shielded, laser-spitting death camels. Repeated blasts from your laser gun would result in the weakening of the mutant camels' shields (in other words they changed colour) and their eventual explosive destruction. Obliteration of all the camels would result in a heart-stopping 'trans-sector hyperwarp' sequence requiring you to dodge speeding rockets until such time as your 'trans-spatial warp field' engaged. You'd then have to battle another legion of more aggressive mutant camels, and so on. The whole retina-blistering experience was kind of like *Defender* reimagined by Terry Gilliam.

"I hadn't yet got to grips with raster interrupts and the scroll registers, which is why the planet movement is just a chunk-rez character scroll," says Minter of the production process. "And I couldn't do real '*Defender* movement' of the ship to save my life, which is why it behaves so anomalously if you reverse repeatedly."

Different strokes

Another problem Minter encountered resided in the differences between the US and UK versions of the Commodore 64 computer. "I had only just got one of the first C64s in the country and it was a US import model," he says. "Some things behaved differently on the US model… so the game, when played on a UK machine, had some flaws… if I remember correctly the camels' arses would fall off at the edge of the screen – the camels were made out of two sprites bolted together."

Minter's oeuvre includes many projects with bizarre plots featuring sheep, camels and llamas but he has also created a number of productions where 'ruminants' (a generic term for our cud-chewing friends) were not the primary concern. In fact, he temporarily shelved work on *AMC* to produce a conversion of his classic *Gridrunner*, a kinetic, compulsive and extremely difficult shooter owing a big debt to *Centipede*. By the time Minter began work on the more sophisticated sequel to

AMC, entitled *Revenge of the Mutant Camels*, he'd become both much happier with the wiles of the C64 and much more comfortable with the idea of working on games that were entirely his own design.

"I never really got properly to grips with the C64 until *Revenge of the Mutant Camels*," explains Minter, "by which time I could at least draw a better camel and use the scroll registers."

Revenge of the Mutant Camels reflected Minter's love of the humped ungulates by placing you in control of a fugitive mutant camel trying to evade its alien masters from the first game, the evil Zzyaxians. It was a much more elegant game than its predecessor and featured far more in terms of surreal imagery. Playing it again nowadays is like taking a trip through the cultural landscape of the early '80s, replete with red telephone boxes and CND badges, and when you die, what sounds extraordinarily like the theme tune to '80s TV sci-fi series, 'Battlestar Galactica'. And that's not even to mention the amusing postmodern schtick of having to fight both the original spaceship from *AMC* and an actual enemy character bearing the awesomely self-referential moniker, 'Manic Minter'.

Interestingly Minter is critical of the somewhat anonymous nature of much contemporary game design, "You should be able to tell who created a game just by looking at it – something that is extremely rare these days. That's what I tried to do with Llamasoft back in the old days, and that's what I'm trying to do again with gnuLlamasoft."

And what about the feeling that many games are about as humorous as a 'Newsnight' profile of Bill Gates?

"I think a lot of games take themselves too seriously. Games should be fun and ideally imbued with some kind of humour," he explains. "A game should make you laugh once in a while, as well as being satisfying to play."

Reassuringly, Minter, now based in rural west Wales with a menagerie of animals, including his beloved sheep, doesn't rule out further appearances by the mutant camels. Although for those **Edge** readers wondering about the roots of his obsession with cud-chewing, hump-possessing mammals, he provides the following, vaguely unsettling explanation:

"I don't know where it comes from, only that I found camels to be attractive, for some reason," he says. "Likewise llamas. And sheep, and goats, and a lot of ungulates come to think of it."

And the philosophy behind *Attack of the Mutant Camels* and Minter's subsequent work? He explains: "Basically all I have ever done is make the games that I really want to play, and I'm just happy if enough other people want to play them as well to keep me in sheep food and curry."

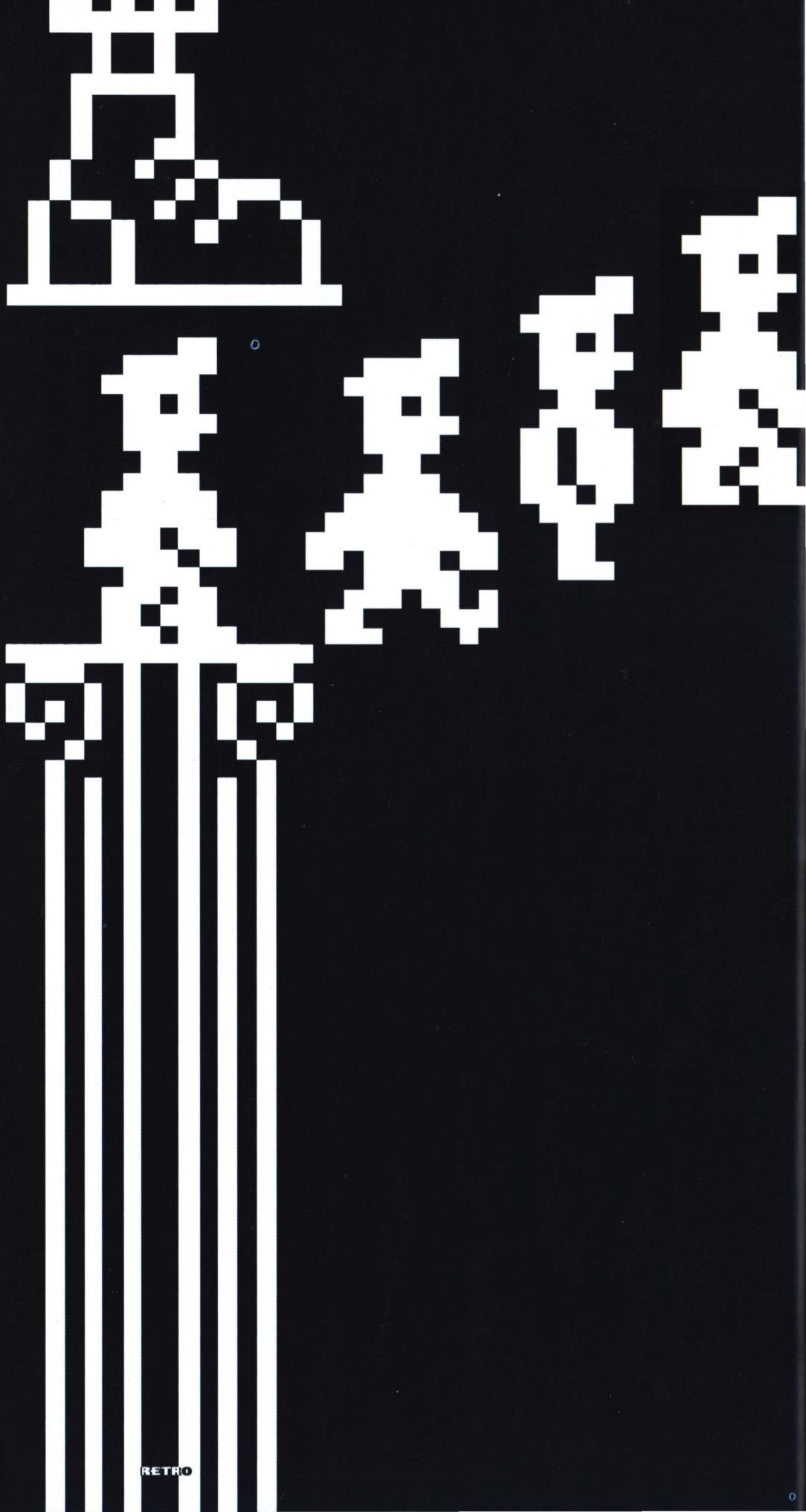
> "I think games take themselves too seriously. Games should be fun and imbued with some kind of humour. A game should make you laugh, as well as being satisfying to play"

Loyal fanbase

Following the demise of the original Llamasoft, in the mid-'90s Minter created *Tempest 2000*, a reinvention of the arcade classic, *Tempest*. For many, Minter's new version proved to be the only justification for owning an Atari Jaguar console. In fact, Minter has maintained a loyal fanbase throughout the period of the original Llamasoft and his subsequent endeavours, and, as the numerous amounts of Net-based cheerleading testify, many of these fans are evidently thrilled to bits with Minter's latest project, namely the recently launched gnuLlamasoft.

"I'm hoping to carve out enough of a niche doing games for PocketPC and PC and distributing them online," Minter says. "Thus far it is going okay, although I really need PPC sales to pick up if I am going to continue supporting that platform."

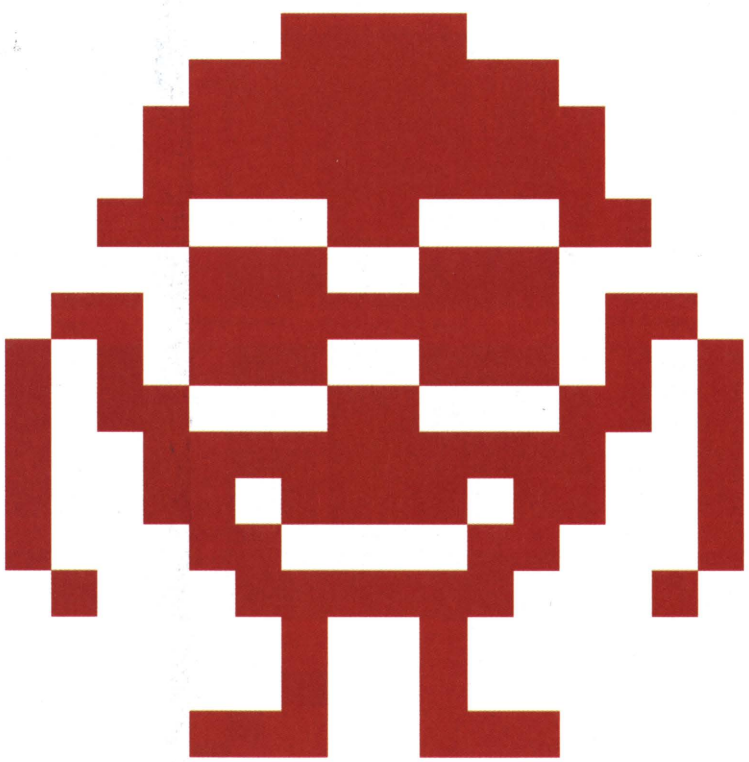
Minter says that nowadays the camels look like "two men in a suit." Although draughtmanship was not his strongest suit, Minter compensated with addictive gameplay and abstract imagery



Original format: **ZX Spectrum**
Publisher: **Bug-Byte**
Developer: **Matthew Smith**
Origin: **UK**
Release date: **1983**

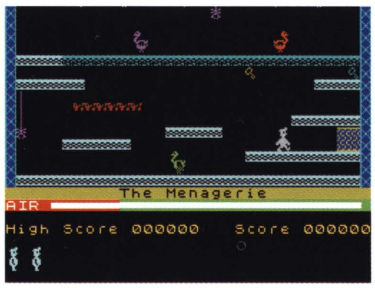
Manic Miner

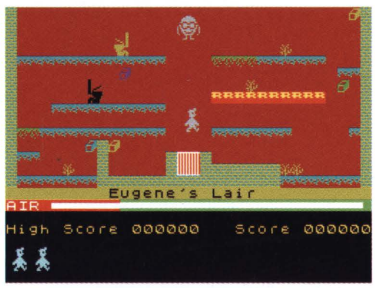
Matthew Smith is a rare thing in the videogame industry: a bona fide 'character'. But after coding Spectrum classics, he disappeared and the rumour mill started up. **Edge** tracks him down and gets the inside story

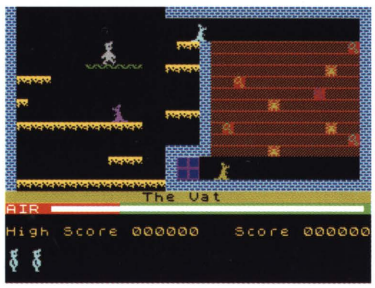


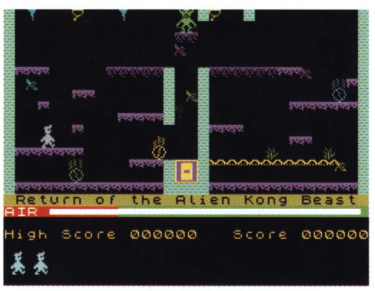
There are few mysteries in the world of game creation, but **Matthew Smith**'s life has become the stuff of legend. Most know the bare bones of his story: coded *Manic Miner* in '83; helped form Software Projects in '84; backed up the success of his first title with *Jet Set Willy* in late '84; and then nothing. Software Projects vanished under a cloud and so did Smith. Rumours of his rock 'n' roll lifestyle culminating in a period living in a Dutch commune were the subject of countless Web sites throughout the '90s. And then a couple of years ago he re-emerged in the UK with his very own (www.the-good-stuff.freeserve.co.uk/index.html).

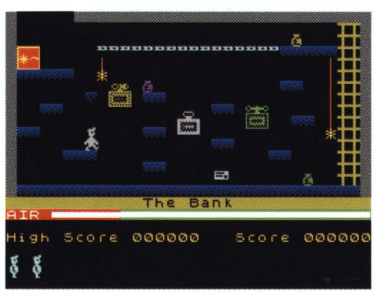
But tracking down Smith didn't get any easier. His appearance on Channel 4's 'Thumb Candy' only served to fuel speculation about his current life. A few emails were eventually answered, but he was non-committal. Smith wasn't about to talk to the press he seemed to distrust so much. A visit to his front door, in the sleepy Yorkshire village of

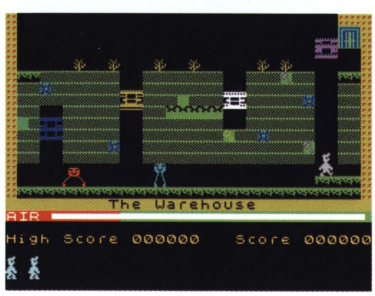


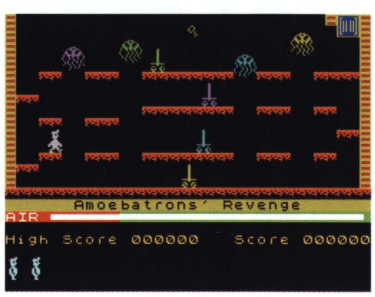


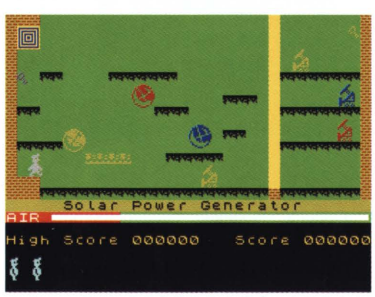


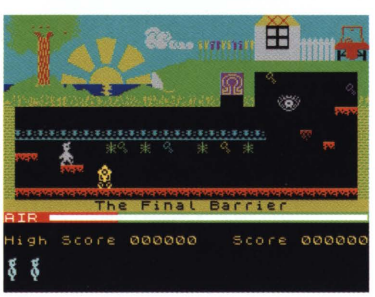




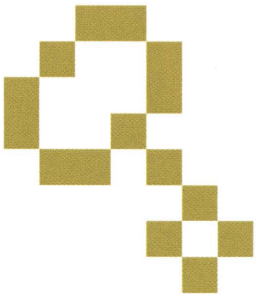








Manic Miner was a great game back in '83, but it hardly stands the test of time. The mystique surrounding Matthew Smith's life has given the game – and its sequel, *Jet Set Willy* – legendary status. While Miner Willy's first quest was difficult to complete, *Jet Set Willy* could only be finished with the use of POKE commands



Dewsbury, was **Edge**'s last recourse. Expecting a flea in the ear, **Edge** was pleasantly surprised to find that Smith was only too happy to discuss the mystique which still surrounds his life and works. The truth, it seems, is far more banal.

"I never disappeared," Smith claims. "I was at home and didn't realise about the comp.sys.sinclair 'Where Is Matthew Smith?' stuff until recently. I went to Holland in '95 and came back in '97. Then I started at Runecraft. There's no real mystery. My disappearance was not my decision, it was yours and your predecessors'. After leaving Software Projects I was signing on the dot [dole], which is what I'm doing now."

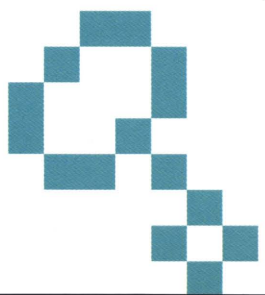
But back in 1983 Smith was a coding celebrity. His unkempt appearance led to questions over his lifestyle, and were the basis of many news stories and interviews in all the popular Spectrum magazines. When the seminal *Manic Miner* – complete with pixel-perfect collision detection, novel level designs and a distinct aesthetic – hit stores, reviewers were intrigued to discover it had been programmed by a jobless 17-year-old.

"I had been programming from the age of 13 on a TRS-80," continues Smith. "I did some of the graphics for *The Birds And The Bees* and then did *Styx* for Bug-Byte. But *Manic Miner* took just eight weeks. There were 20 levels, but I did most of the testing on the first level. Once it was going, then it was just about designing the levels. There were no niggling problems whatsoever." Structurally, Miner Willy's exploits were simple: collect the level key and take it to the exit point. But it was the graphical flair – complete with animated telephones and flying lavatories – that set it apart. Other novelties, such as gently collapsing platforms and an oxygen meter, gave the game its distinctive flavour. Smith, however, remains modest about the game's achievements: "I have to say Bill Hoag was an inspiration. He did all the decent games on the TRS-80. He did *Miner '49er*. It's remarkably similar, and I had that before I wrote *Manic Miner*. It's almost fair to call it a rip-off. I think he had a triangular jump rather than a parabolic one, but otherwise it was just a matter of the Atari graphics and the Spectrum graphics. I think it broke the mould a bit on the Spectrum. It made really good use of that machine back in '83. I got the money upon completing *Styx*, which was £3,000, and I got £8,000 for *Manic Miner*."

But were the stories about the coder once known as the millionaire programmer completely false? "In the end I worked out that I got about £35,000 from Bug-Byte altogether. But it was like extracting teeth. Suing was a normal part of wage negotiation. It was standard practice. The money didn't exist until the game went on sale, but it was obvious *Manic Miner* was going to be a hit. I must say, I squandered the cash I had. If I'd known I wasn't going to get any more I wouldn't have. Still not much excuse for blowing that amount."

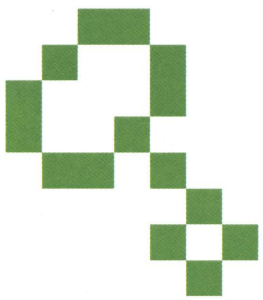
Willy: where now?

Flushed with the success of *Manic Miner*, Smith was keen to keep the momentum going with two sequels: *Jet Set Willy* and the now-infamous *Miner Willy Meets The Taxman*. But Smith was dissatisfied with his publisher and decided to set up his own publishing house, Software Projects. "It was originally going to be me and Alan Maton. He worked for Bug-Byte, but saw that the grass was greener. Then Alan came to me one day and said, 'I met this guy who's into financing and he's good at business and he does games.' So when we actually started Software Projects there were three of us. I was actually a minority shareholder in that. There was no finance involved. I actually became a full shareholder when I finished *Jet Set Willy*, somewhere around 33 per cent, but still short of that magic 50 mark. If I got my third I would still have been happy – I thought if I had a third of the company, it meant I could spend a third of the cash."



If *Manic Miner* was a breeze for the young coder, the technical leap made by *JSW* combined with the pressures of forming Software Projects proved debilitating. "Designing the levels for *Jet Set Willy* actually did take a lot of time, but there were external pressures – partners, essentially. Apparently I was the director of a publishing house, but I was writing the game at the same time. *Jet Set Willy* took eight months. Though there were three times as many screens as *Manic Miner*, there was no excuse. It was pure management drag. I was getting just a basic salary of £50 a week. The chief programmer almost starved to death. That's where it all went wrong. They were sabotaging my phone line. They thought if I was on the Internet to America, it meant I was phoning America. They thought I was their wayward child rather than a director."

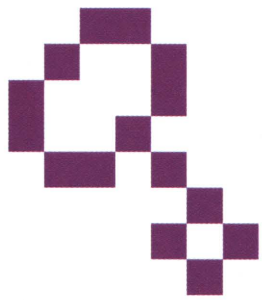
During Smith's time at Software



Projects other coders were taken on and the company even launched a budget line. *Miner Willy Meets The Taxman* (which had the working title of *The Mega Tree*), *Attack Of The Mutant Zombie Flesh Eating Chickens From Mars* and a top-down football game, tentatively entitled *Footy*, were all partly coded, but never completed by Smith. Was the decline of Software Projects a case of mismanagement or irresponsibility on his part?

"I was at Stonehenge in '84 but not in '85. Things were getting heavy, man," he says, cryptically – although it's worth remembering that '85 witnessed a police crackdown on the travelling community, culminating in the 'Battle Of The Beanfield' near Stonehenge.

"Irresponsibility? Okay, I confess to that but I never got a single payment for *Jet Set Willy*. I was livid. It was always down to 'accounting difficulties'. Alan did most of the running of the company. I was going to do the games and he was going to do the publishing. And originally there was going to be this 50/50 split. Lovely jubbly. He got the tapes duplicated, saw all the press and distribution. Tommy, he sat in the background and made executive



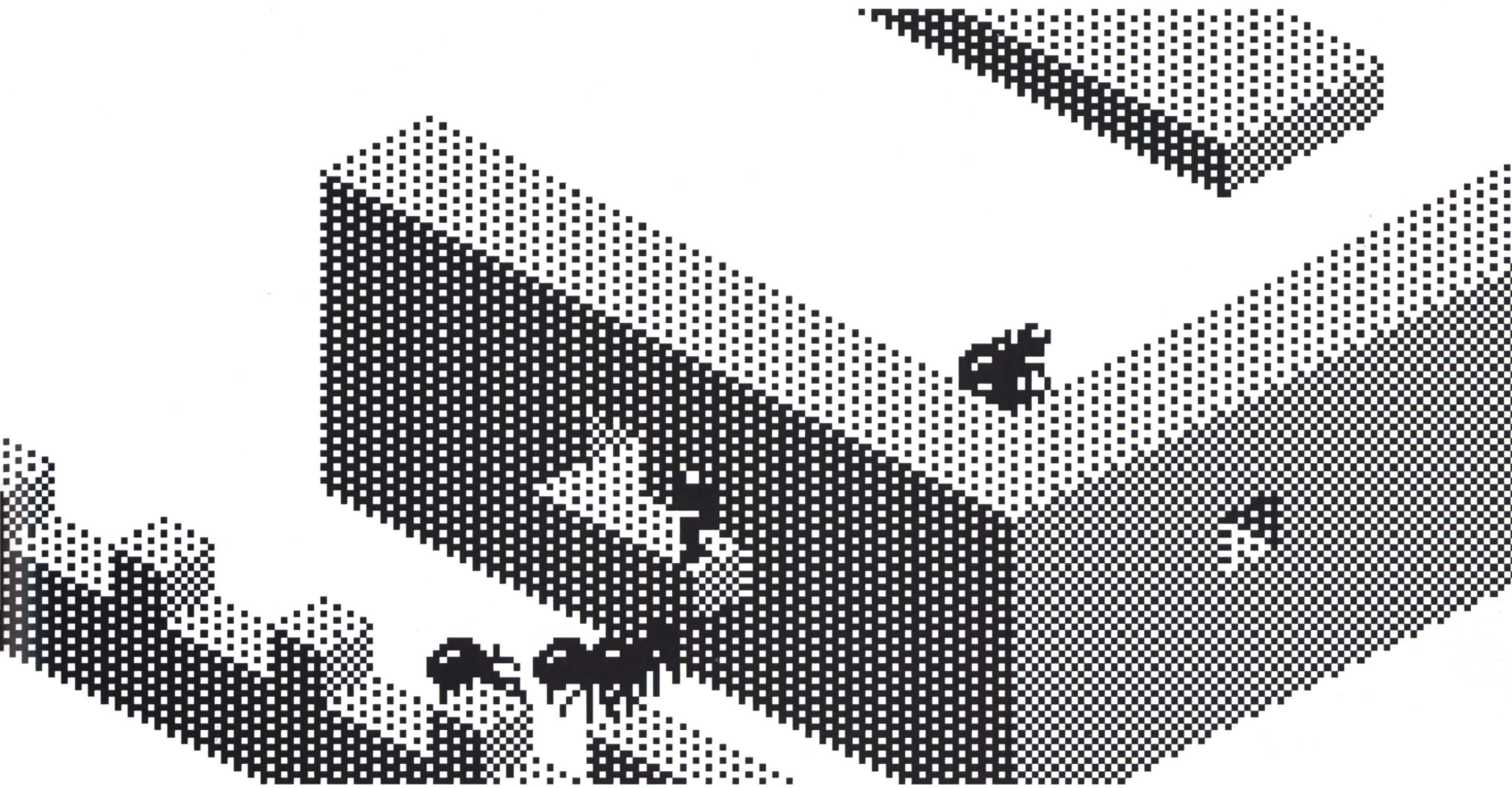
decisions and, er… it was all working as long as it worked. Somehow when it all went sour it was me and Alan who fell out. Software Projects was eventually dissolved by decree in 1989."

After a short spell at Runecraft (crunching a dictionary into a Game Boy Color *Scrabble* title) Matt Smith is back on the Net and using his spare time to update his home page. No big projects are planned, but his story is sure to remain a talking point in Spectrum discussion groups. After being deported from Holland in 1997 Smith decided to change his name to Matt from Earth – the monicker he prefers to use whenever anyone asks for his autograph. But is he still surprised by the unshakable interest in his life and works?

"I used to be. I suppose it's quite nice really. Well, I guess it's going to happen if I don't reply to my emails." The reclusive coder's mind wanders for a brief second before he indicates the interview is over. "Do you want to meet the guy who wrote *Chuckie Egg*?" he ends. "He works just up the road."

Ant Attack

'Art for art's sake, money for God's sake' may well have a peculiar resonance for Sandy White, creator of isometric groundbreaker *3D Ant Attack*. **Edge** talks to the sculptor-turned-coder about his early encounters with the industry



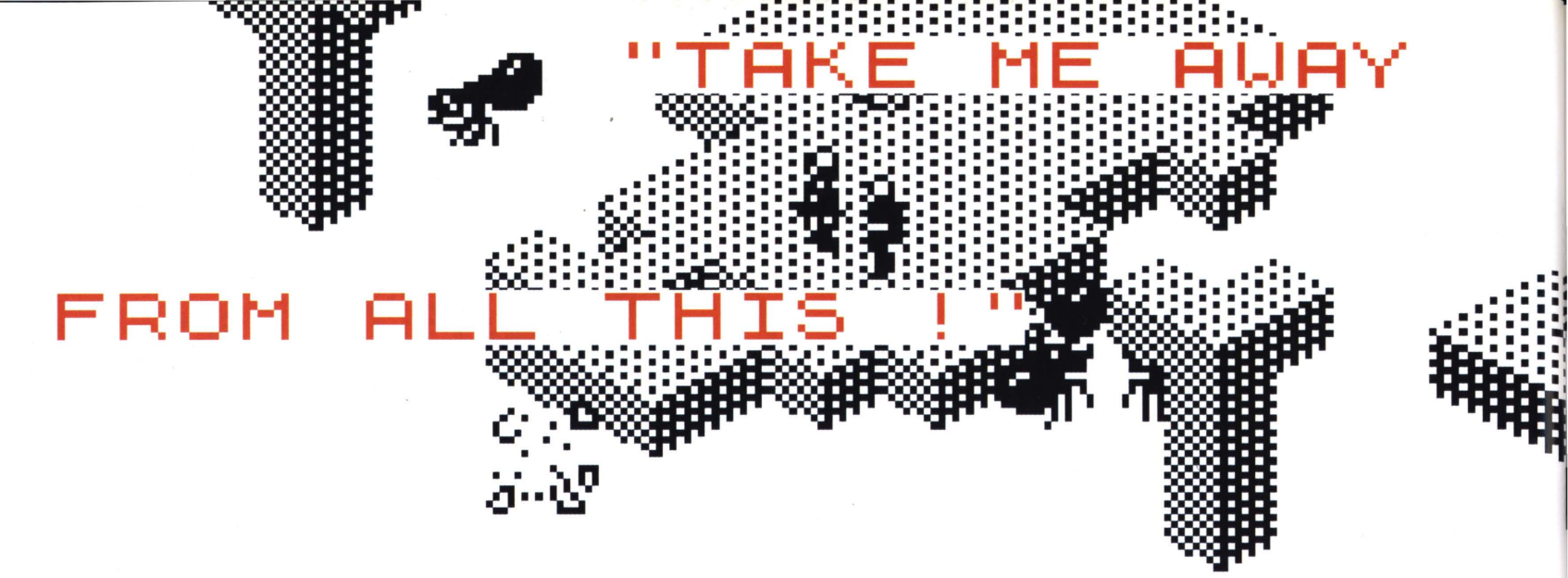
Original format: **ZX Spectrum**
Publisher: **Quicksilva**
Developer: **Sandy White**
Origin: **UK**
Release date: **August 1983**

Argonaut's *Alien Resurrection* may lead the field in videogames which set out to fray the nerves and set the pulse racing, but back in 1983 an art student from Edinburgh was already finding ways of making the humble ZX Spectrum do the same. *3D Ant Attack* may not have managed to make it into **Edge**'s top 100 games, but it marked the very beginnings of the survival horror genre. A full year before *Knight Lore* was released it also became the first example of a game developed with the action viewed from an isometric perspective.

Today it is difficult to look at those shaded walls and tiny sprites without raising a supercilious smirk, but in its day *3D Ant Attack* was the most terrifying experience you could have on a home computer. Armed with only a limited supply of grenades and with a severe time limit you had to sneak into the infested city of Antescher and rescue your trapped partner. Interestingly, *3D Ant Attack* was also the first game to offer the choice of playing as either a boy or a girl.

However, *3D Ant Attack*'s creator **Sandy White** was not your typical bedroom coder. He learned his trade from very different beginnings. "Before writing *3D Ant Attack* I was studying at Edinburgh College of Art," he reveals. "For much of that time I had been up to my elbows in plaster of Paris, ribbon cable, radio control servos, and Christmas tree bulbs. At the end of '82 I had my own one-man show which featured three storytelling computer-controlled sculptures, each based around the SC/MP chip that was in Sinclair's first computer, the MK14 – that's how I learned to program."

By this time he had been truly bitten by the programming bug. A period on the dole gave White the extra incentive to turn his experiments into a living, breathing game world. The inspiration for the title, however, derived from an incongruous origin. "I had just seen 'Superman' the movie, because the



next thing I did was make a little sprite which flew over this weird random landscape, though as history tells, it never occurred to me to make a 'Superman' game. At this stage I was still thinking about the sculptural possibilities. Later on it became apparent that there was a striking similarity between the isometric structures in *Ant Attack* and etchings by M C Escher; the city was eventually named Antescher in tribute."

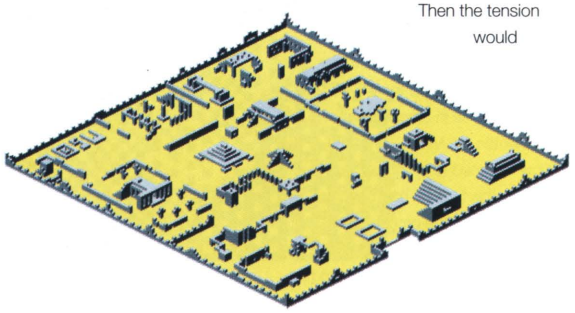
Although the buildings contained in the city were blocky, clearly defined structures were noticeable. Indeed, the church and graveyard were designed by White's girlfriend at the time, Angela Sutherland, who went on to found Perfect Entertainment. Standing outside the gates of Antescher could be unnerving in itself. All would appear quiet and the city devoid of inhabitants. A jump command was included to enable the hero to scale certain edifices and cross the city's threshold. Then the tension would begin to mount. It was possible to slowly make your way into the heart of the seemingly deserted city, but once a giant ant became alerted to your presence it wouldn't take long for more to follow. Dispatching initial attacks was essential if your position was not to be overrun. Standing stranded and defenceless on a hill as more and more rapacious insects swelled the ranks of your attackers could be a truly disturbing experience.

The swarming routines were one of White's first considerations: "I had this engine that drew cubes and did little else, so the first thing I had moving around was a cube. This became a black cube, then a black blob. Then it became a herd of black blobs. What had become interesting to me were the flocking properties that grew out of simple rules given to the blobs. They could be made to either seek or avoid a cube that you could control with the keyboard. I did at one point consider doing a sheep farming game. I bet that would have been a big seller.

"Anyway, eventually in went a couple of human characters, and because of a bug one of the blob sprites was drawn as a human and started to follow the other human. *Ant Attack* was born. The blobs got legs and it became a kind of hide and seek while avoiding the blobs-with-legs."

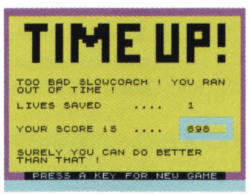
White created one of the most tense and exciting games of its time, and the coding behind the endeavour was anything but simple. Without the community that exists today he had to learn everything through trial and error. "I was not using an assembler as I had never heard of them," he recalls. "This meant I had to assemble by hand, writing the mnemonics on a sheet of A4 and shoving the op-codes in the margin. Trouble was, when you wanted to insert a line somewhere you had to go back and recalculate all the jump offsets – it was hideously slow. Once the hex was put together on paper it was typed into my Softy. The Softy was a ROM emulator with four whole K of RAM which I mapped into the Speccy's memory map via its rear connector. This meant that the whole of *Ant Attack* had to fit into 4K, leaving aside the data for the city, and some BASIC for the scoring screens."

Though the game was only half complete, White was confident it had the potential to be a commercial success, but publishing was slightly less well organised in 1983 than it is today. "My first thought was to try Sinclair themselves, as they were already publishing their own games. Being very paranoid about the code, I sent a videotape of *Ant Attack* off to Sinclair Research, only to have it duly returned with a note saying they were unable to view it as they didn't have a VCR. Looking around Smiths the following day I picked on Quicksilva as a good alternative, as they were the only publisher at that time who had put out a game with a colour sleeve. Everyone else was still at the stage of selling cassettes with black-and-white inserts – many of them simply photocopies, believe it or not."



Ant Attack was one of the first games to take place in a fully formed city. Spectrum fanatics started mapping immediately

At a press conference White was asked by a journalist about the incredible new perspective in *Ant Attack*. Somewhat lost for words he remembered an old sculpting term: 'isometric'. The term stuck and has since entered the gaming lexicon



BITTEN!

He telephoned Quicksilva, but the company was more than sceptical about a game which had characters climbing over 3D scenery and through windows on the Spectrum. But after sending a videotape, the company was convinced. "We were picked up by Rod Cousens (who went on to become an Acclaim supremo) at the airport, and transported to Quicksilva's Southampton office, cramped into the back of a Ford XR3i. Negotiations began. I thought 50 per cent was a reasonable sort of start, if a bit generous to Quicksilva, given that they had done none of the work. Yes, perhaps I was a bit naive. I insisted I would go no lower than 25 per cent. I think eventually they offered 20 per cent and locked us in the Post House Hotel until we agreed. We sneaked out early the next morning and flew back to Edinburgh without telling them. The next day I got a call, and they offered 25 per cent. Oh yes, we'd been very clever, but not clever enough to specify what it was 25 per cent of. Eventually I found I was getting 25 per cent of the 'returns', which means a quarter of what comes back from the shops, ie 25 per cent of 50 per cent, or 12.5 per cent-ish. A pretty average deal. You live and learn, as they say."

The deal done and dusted, White had still to complete the game: "Panic ensued. The scoring screens were written in BASIC for speed, meanwhile the cover artwork was being created, blurb written and the game renamed by Quicksilva from *Ant Terror* – my brilliant name for it – to *Ant Attack*. I believe they bought the name for a few a few hundred quid from someone else who had written another *Ant Attack*. Wonder whatever happened to that?"

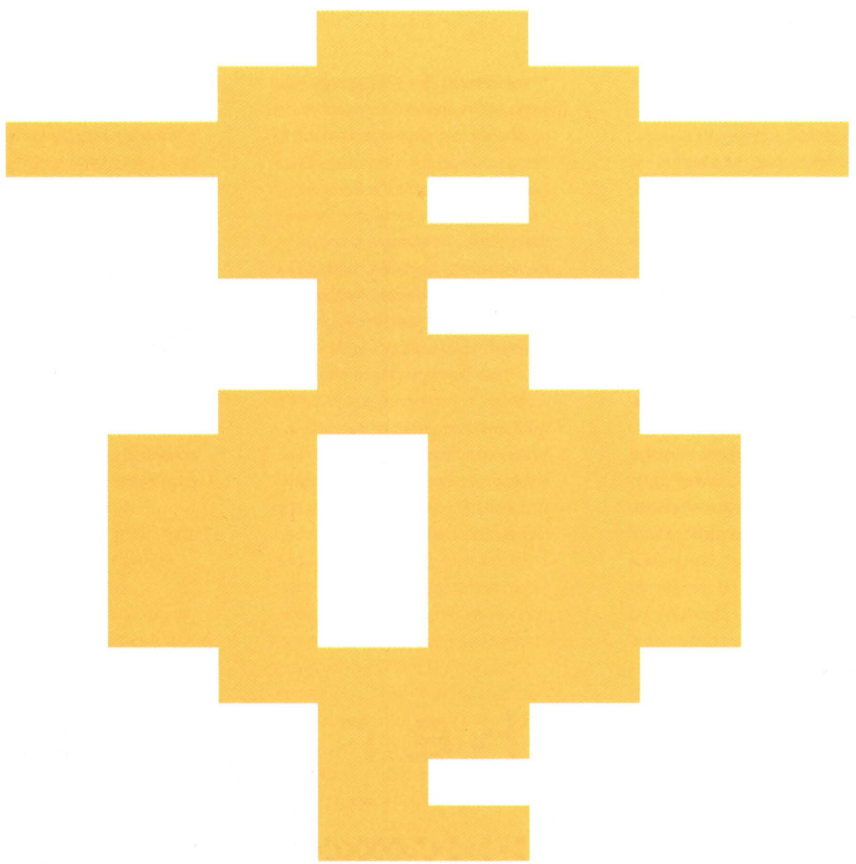
Press launches for games were rare in the early '80s, and White vividly remembers hitch-hiking down to London to see the product for the first time at a computer show at the Barbican. "Everything was very homely," he remembers. "There, standing at a tiny stall with a massive pile of *Ant Attack* tapes, were the founders of Quicksilva. They were selling copies as if they were hot cakes. Some bloke called Jeff Minter from the stall opposite had apparently been asked what he thought of it and said it wasn't bad."

But for those who believe there is no heart in publishing, White recalls one moment which reaffirmed his belief in the industry. When the day drew to a close it became apparent to John Hollis – co-founder of Quiksilva – that White and his girlfriend had nowhere to stay. "We were both on the dole," explains the coder. "But in a gesture I'll never forget, John opened the till, reached in and removed its entire contents, and thrust them into my hands. Later, from the security of our posh hotel room, we counted many hundreds of pounds – more dosh than either of us had seen in one place, ever."

Have another go!

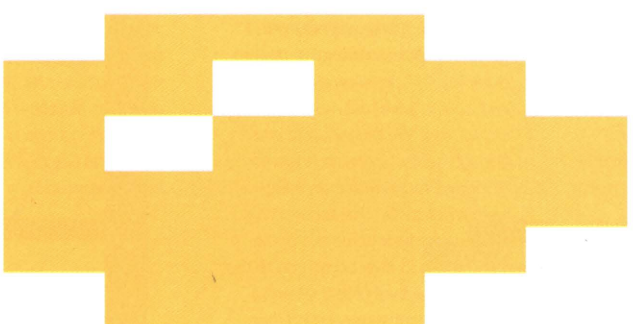
Chuckie Egg

Elite may have been the BBC Micro game of choice for computer science nerds, but across the room another title was fast becoming the favourite for a whole generation



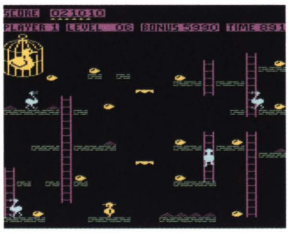
chuckie egg

Shigeru Miyamoto clearly had no idea what he'd started. A videogame with a quest, clearly defined levels and a distinctive hero was never expected to sell well. But *Donkey Kong* went on to become one of the most iconic games in videogame history and spawn a generation of platformer clones. Most, of course, were shoddy facsimiles, but if one game took the formula and elevated it to new heights it was the humble ZX Spectrum and BBC Micro classic, *Chuckie Egg*.



Original format: **BBC Model B**
Publisher: **A&F Software**
Developer: **In-house**
Origin: **UK**
Release date: **1983**

Those who have never experienced the kinetic thrills of *Chuckie Egg* have missed a treat. While most 3D games still make players scream in frustration as they plummet from another 'greasy' ladder, *Chuckie Egg* perfected the deft platform to mid-ladder jump with some aplomb



The programmer, **Doug Anderson**, takes up the story, "It was actually an external guy called Nigel Alderton who came to us with a Spectrum program he'd done called *Eggy Kong*. It had one level and was very much based on *Donkey Kong*, except you ran around avoiding hens and collecting eggs. [Alderton's account is somewhat different: he claims that his game was in a finished state when Anderson first saw it.] They were meant to be hens but they looked more like ostriches. It developed from there because I was really a BBC programmer at the time. I thought, I'll take his idea and work around it and he actually ended up writing the Spectrum one anyway. We worked on it as a team and there were a few people chipping in ideas."

Anderson had been trying to establish his own games company for two years when *Eggy Kong* came along. A&F Software was founded in 1981 with his partner Mike Fitzgerald ("We couldn't think of a more imaginative name for the company," admits Anderson) and Acorn Atom titles such as *Polecat* and *Early Warning* had failed to put the fledgling company on a secure footing. But the game that would eventually become *Chuckie Egg* changed all that. Developed in three months from a small one-level demo the game would eventually go on to every 8bit platform and become one of the most cherished titles of its generation – spawning several fan Web sites in the process. For Anderson, the game's popularity is still something of a mystery. "It did surprise me. We didn't try to figure out why until a long time afterwards. It was because you could keep going, maybe, I don't know. I obviously didn't plan to make it that way otherwise everyone would have used the same formula."

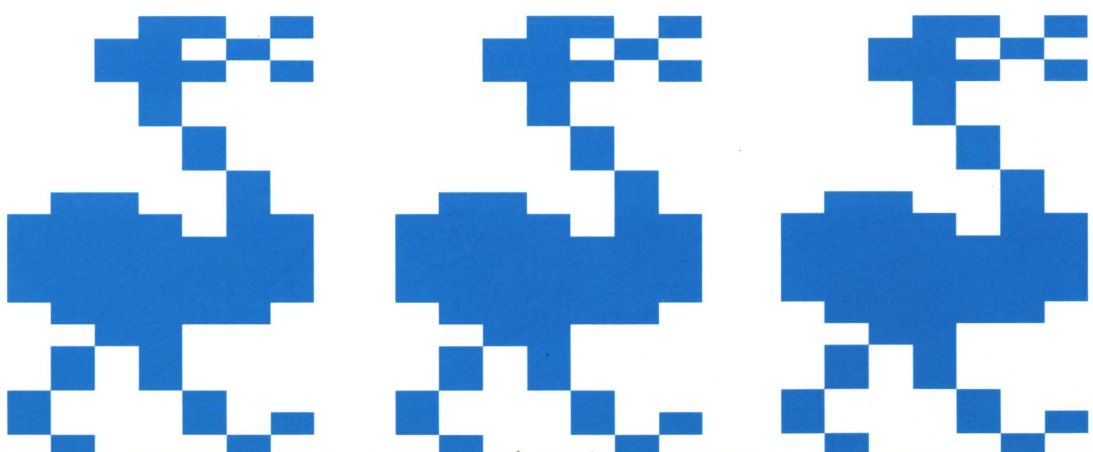
Although there were only eight screens and a rudimentary goal (get Henhouse Harry to collect all the eggs under a certain time limit) the fact that the game looped around several times gave it a great deal of durability. "We knew we would run into trouble if we had more than eight levels. We thought that was enough, really," explains Anderson. "It looped round and then there were more birds. The second time around the duck came out of the cage, it would dive-bomb you all the time. On the third time the hens walked at double speed and then on the fourth time, if you got that far, you got the fast hens and the duck. You could even go around another time. That gave you about 40 levels altogether. We didn't expect anyone to get that far because the time limit came down, too. There was no end screen, you just kept going and going. We expected people just to play until they got fed up with it, but people kept playing it and scoring millions. We were flabbergasted, really."

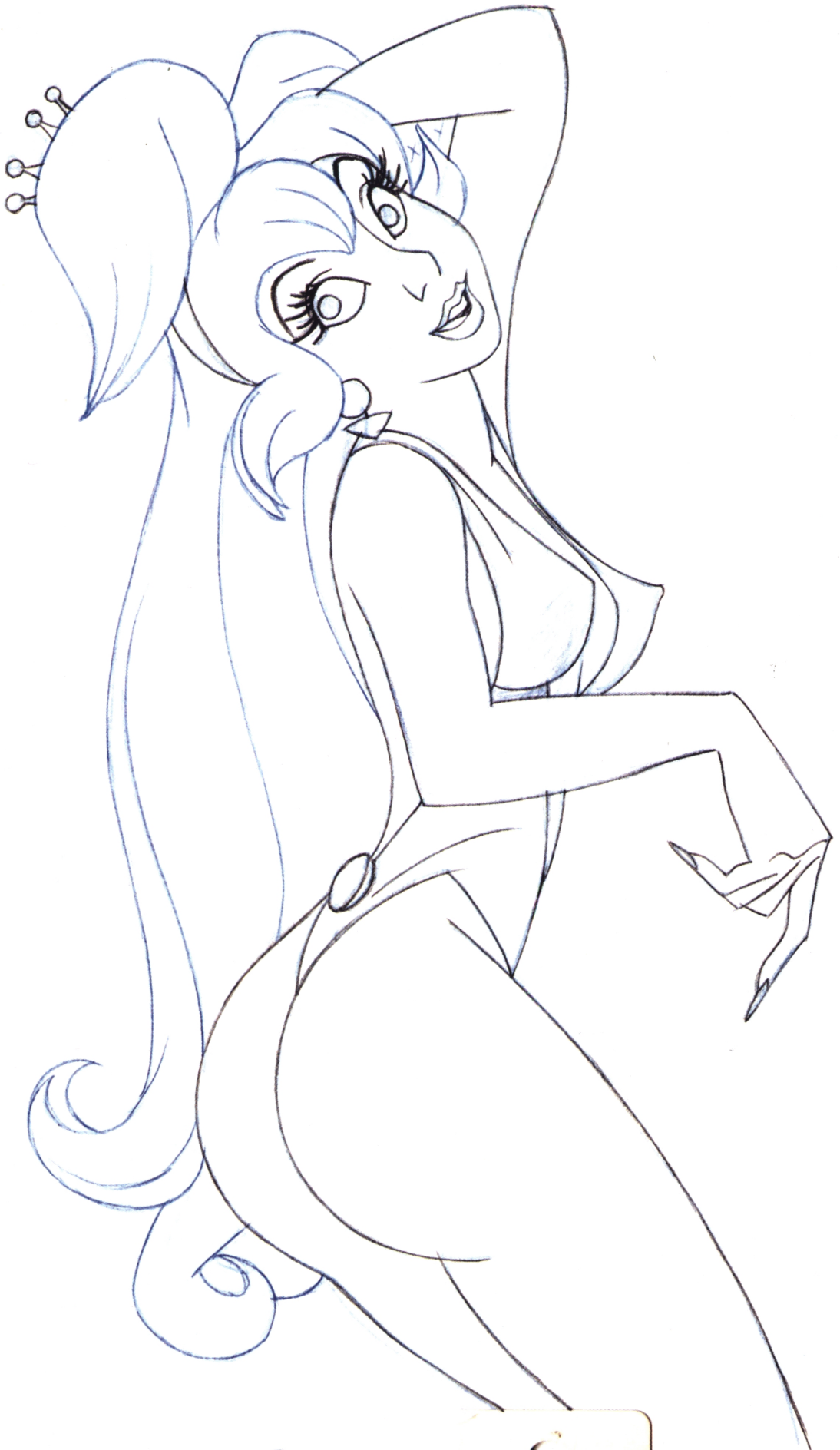
Key to the game's success was its super-fast pace (for an 8bit game), its accurate collision detection, and some engaging level design. Anyone who first played a version of *Chuckie Egg* back in 1983 will attest to its sheer kinetic pace and energy. Jumping from platform to platform was transformed from the usual pedestrian leaps (even *Manic Miner* was inferior to *Chuckie Egg* in this respect) to incredibly nimble negotiation of the game's space. Leap from one platform to a moving lift and you just knew the distance and timing required to hit your mark. And avoiding hens by a hair's breadth by leaping onto the middle of a ladder, rather than having to negotiate it from its top or foot, was just one of the nuances that made *Chuckie Egg* such a tactile experience.

But the humble BBC Micro and Spectrum processors couldn't handle sophisticated physics – it was all a shorthand technique produced by calculating simple properties. "The thing that took me the longest was trying to get the landing on the platforms right," explains Anderson. "Depending on which level you were on, would you fall down or diagonally? The bouncing was interesting. It gave the impression that there were real physical laws in there. There are so many platform games where you fall off the edges of the platforms and you just went straight down. But in *Chuckie Egg* you fell in a proper arc. But it wasn't difficult to do. Just a few days' work. We had problems when you were approaching a couple of platforms at a strange angle and you could end up going through the other side. The collision in there was accurate as well."

Just a few weeks after seeing *Eggy Kong* for the first time, Anderson had completed his BBC Micro version of *Chuckie Egg* (Nigel Alderton developed the Spectrum version at the same time) and A&F Software was ready to put the game into production. "We were self published back then," recalls Anderson. "We had our own little factory unit and we had banks of cassette decks and we did our own duplication which included people sticking labels on everything. It cost about 50p to make the tape, we then sold it for five or six pounds. But there was VAT on top of that. The distributors took a bit. I think we got about 40 per cent in the end off the net price. [*Chuckie Egg*] never made a huge amount but it was a good steady earner for quite a long time because we kept putting it out on different machines: the Commodore and the Amstrad and the Dragon."

Unfortunately the cult following *Chuckie Egg* received couldn't keep A&F Software afloat and in 1985 the company went bust. When other development studios were being gobbled up by publishers, A&F struggled on meeting the demands of advertising rates and distribution prices, but to no avail. *Chuckie Egg* remains its most enduring title, and a supreme example of speed, simple design and a gentle learning curve combining to produce a piece of videogame magic which can never be traced among any number of subroutines and integer arrays. A true Easter classic.





013

RETRO

G-3

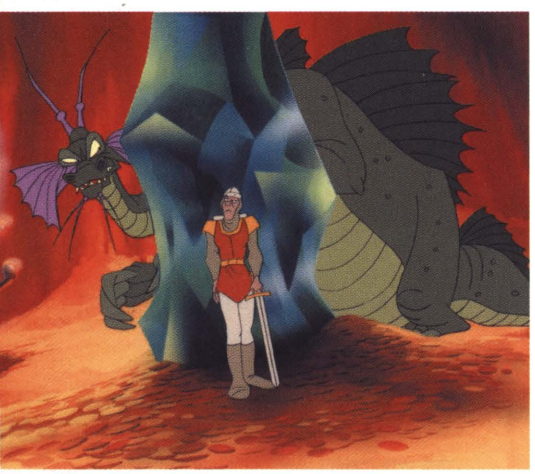
Dragon's Lair

Few coin-ops manage to stop arcade-goers in their tracks, forcing them to do a double-take in order to assure themselves that what they'd just seen was actually real. In 1983, this game did exactly that

Dragon's Lair is the story of a knight who runs into a booby-trapped castle to save the fair maiden from the evil dragon. No, it's not a very original story, nor was it the most successful title of all time, but its introduction was probably the biggest event in videogame history. Everybody remembers where they were when they first saw *Dragon's Lair*.

To this day *Dragon's Lair*'s lead developer, **Rick Dyer**, still gets unsolicited emails from fans telling him what an impact the game had on their lives. Twenty years later, the game is still selling and it's one of only three videogames to ever make it into the Smithsonian (Atari's *Pong* and Namco's *Pac-Man* being the other two). It was a cel-animated videogame produced with Laser disc technology. It was mesmerising. Players and spectators would stare in awe. The look reminded Dyer of

Original format: **Coin-op**
Manufacturer: **Cinematronix**
Developer: **Rick Dyer/Don Bluth Productions**
Origin: **US**
Release date: **1983**



Clark's Law, which states: "Any sufficiently advanced technology is indistinguishable from magic."

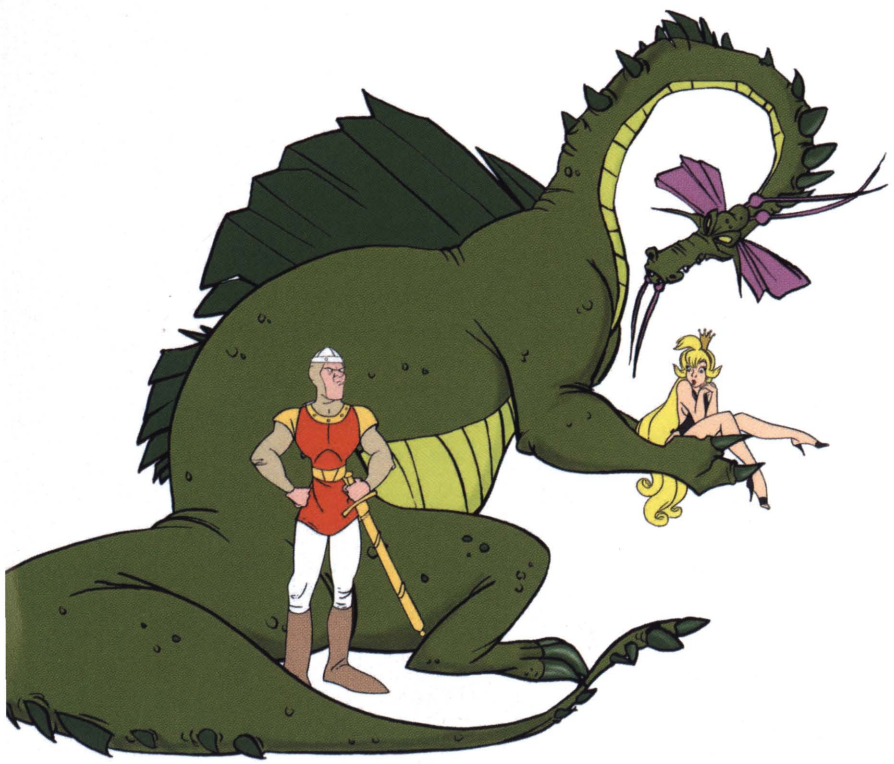
The ugly early days

For two years, Dyer's company, Advanced Microcomputer Systems, worked on an interactive fantasy world game. Using the original text-based title *Adventure* as a model, Dyer wanted to push the concept further by making it more visual. He experimented with cash register paper, a giant Rolodex, and even a cassette deck. Nothing worked. They all used linear access and were thus too slow. He needed random access. He needed the Laser disc.

Dyer developed a slideshow Laser disc version with instant access, but it still wasn't good enough. The game had to be animated. "I went to see 'The Secret of Nimh' and I pointed to the screen, saying, 'That's who I want to animate *Dragon's Lair*,'" Dyer remembers. That 'who' was Don Bluth Productions. Dyer presented **Don Bluth** and his production team – Gary Goldman and John Pomeroy – with the idea of animating a Laser disc interactive swords 'n' sorcery game. Since the Bluth team had no projects on the go at the time, and 'Nimh' was a financial disaster, they agreed.

The first four weeks of development did not go well. There was a little tug of war as to who was boss. As Bluth recalls, "Rick was trying to write the story and I was saying, 'Let's go a different place.' He brought the project to us, but he's not going to tell us how to animate it… He had done some little sketches and drawings which I looked at. And by my standard, I said, 'No way.'"

Ultimately, Dyer relinquished animation control to Bluth's group, yet both parties still hammered at the story. Dyer locked his team of seven designers in a room and forced them to write and critique each other's work. It sounds cruel, but it was the only way he knew to feed Bluth's group of 300 animators. Scenes were still being rewritten by the Bluth group and as a result there were lots of hurt egos. In retrospect, Dyer realises that the process was caustic, but he had no choice: "We were animating a game that wasn't written yet. And the reason was because we were in a race against Bally – and I think *Asteron Belt* – to be the first ones to get out there into the marketplace. And we knew if we got there second we were dead."



Threats

Dragon's Lair is structured by a series of threat moments. Understand the threat and respond correctly with the joystick or sword button and you'll get to see the next segment of film. But how do you know what to do? *Dragon's Lair* moved very quickly. Players either didn't get it or didn't have time to figure what to do. So the threat moments needed a visual cue, which was the yellow flash letting you know which way to push the joystick. It wasn't much help. You only get eight frames – or a third of a second – to react. The only way to win is to learn the game.

The structure of the experience – the threats – was Dyer's responsibility. The look, sound and characters were on Bluth's shoulders. "We wanted to make Dirk not just an object or a knight that's trying to go through the castle, but we wanted to give him a personality. So that he was memorable," says Bluth. "Which means you're going to have to like what's going on in his head. And his body language is going to tell you something about what's going on in his head." Using Charlie Chaplin as a model, Bluth made Dirk something of a bumpkin: "He has illusions of grandeur. He actually thinks he's greater than he really is. That's what makes him funny. He'll tackle something that seems absolutely overwhelmingly impossible because he doesn't get that it's impossible." Daphne, the object of Dirk's affection and the prize at the end of the game, owes her luscious form to the poses in Gary Goldman's five-year collection of 'Playboy' magazines.

Bluth couldn't afford to hire a really good voice talent, so he asked his editor, a naturally funny guy, to be the voice – or rather the sounds – of Dirk. Dirk didn't talk (another tip of the hat to Chaplin) – he made noises to show how he felt. Bluth asked another employee to be the voice of Daphne. She got to talk.

Cliffhanger

"How can I write each little episodic moment in this journey to the princess which shows maybe at least three to four dangers that must be overcome?" says Bluth. "And how can I do it so I never repeat myself and it's interesting every time you're in there?" For inspiration, he went back and looked at videos of old serials he used to watch in cinemas. He noticed that each serial episode ended with a really good cliffhanger, like a ledge retracting and the hero about to fall into a pit of fire ('Tarzan') or maybe a pit full of squids ('Thief of Baghdad'). "All the fears that humans have, we wrote them all down and then began to figure out ways to portray each of those fears," explains Bluth. Those

fears worked their way into each episodic moment, making the game a series of really good cliffhangers.

The death nodes

The most popular scenes to animate were the death nodes – those bits of animation where Dirk dies in one of about 50 humorous ways. He could fall down, get squashed, constricted, or burned. As you watch Dirk laugh as he's being eaten by bats, "You didn't really take these deaths too seriously 'cause it was like a cat with nine lives," says Bluth. "You got to come back to life and try again." Dirk's lives were limited to five.

Advanced Microcomputer Systems field tested the game at the Malibu Grand Prix in El Monte, California. When Dyer got down to the test site, by what appeared to be a call of distress by his creative director Victor Penman, he couldn't believe what he saw: "There were hundreds of people and they were standing there with their mouths open and their eyes dilated just staring at our game. And when I got up to the machine, there were quarters all across the front panel." You couldn't even move. There were probably 200 people, and they weren't going anywhere.

After a few minutes Dyer ran to the pay phone to call the president of Cinematronix – the distributor of *Dragon's Lair*. Cinematronix was running its own field test in San Diego, California. Before Dyer could say a word, Cinematronix's president said, "Yes, Rick, the same thing is happening here."

Success

Although Bluth had no previous gaming experience, he had a good idea as to why *Dragon's Lair* was so successful: "I think the reason they were so excited by this new game is that up to that point there had not been anything visually very entertaining in the arcades. It was all very pixellated, very strange little creatures that weren't too complicated. But for the first time this looked like something >

in the world of entertainment."

The game broke a coin-op landmark when Cinematronix set the price at 50 cents, instead of a quarter. The company had to. The Laser disc player alone cost $1,000. "The only way that we could get the trade to buy the product would be if we could be successful in charging 50 cents," says Dyer, "because otherwise there would not have been an adequate return on investment for the operators. And of course, as it turned out, *Dragon's Lair* was so successful that the operators

"There were hundreds of people standing there with their mouths open and their eyes dilated just staring at our game"

were paying for their machines in as little as a week to two weeks… because the game was being played around the clock."

The team went on to create two more cel-animated Laser disc games – *Space Ace* and *Dragon's Lair II*. But neither machine was as successful as the first. The Laser disc era more or less began and ended with *Dragon's Lair*. "You just technologically hit the wall head on," realises Dyer. Still, 20 years later, the two teams have come back to create *Dragon's Lair 3D* – a videogame that retains the cel-animated feel of the original.

Looking back on the experience, Dyer says, "It was actually a fantastic process that was happening on the fly with two groups of people that had never done anything like this before. It was really a point where nobody told us we couldn't do it. There's a lot to be said for not knowing you can't do something."

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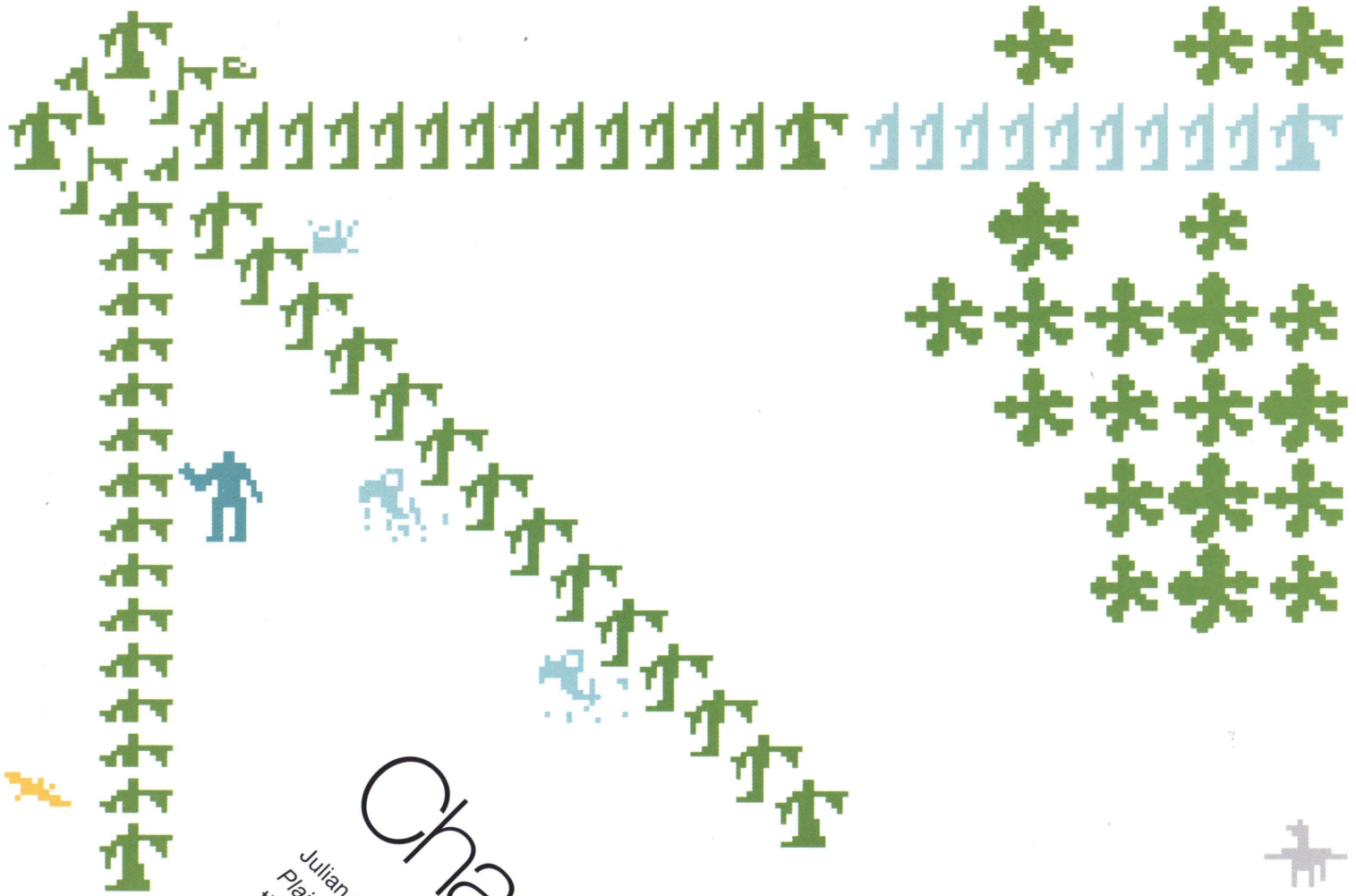
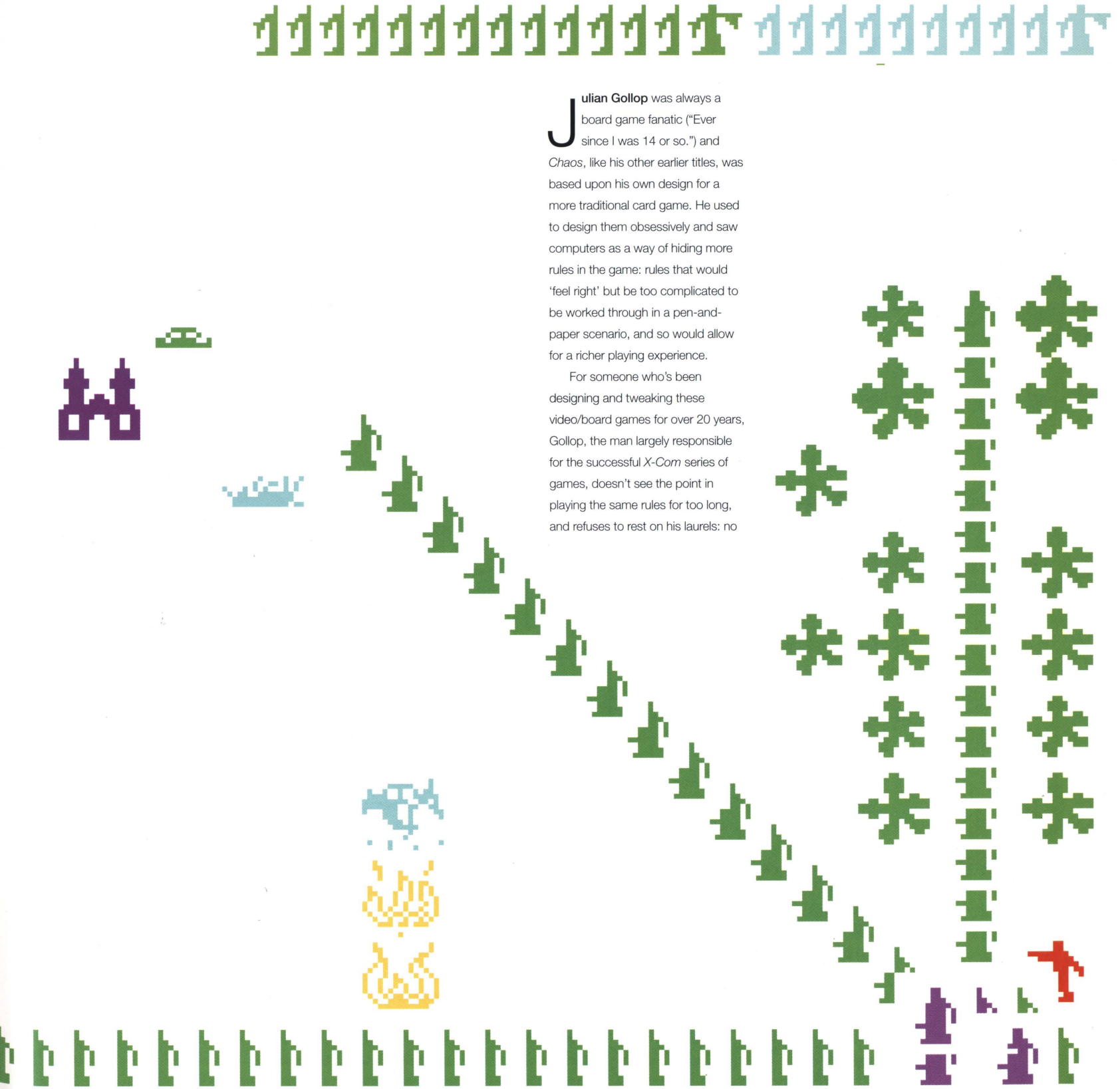


Chaos

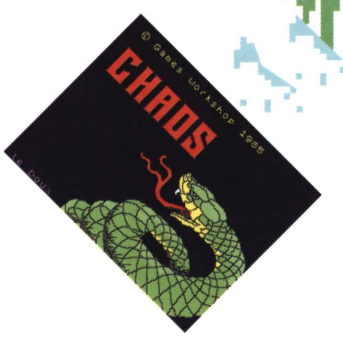
Julian Gollop's imaginative strategy title (subtitled *Magic & Death on the Plain of Limbo*) brought board games into the 20th century, and took the first step down an alternative path for mainstream videogames

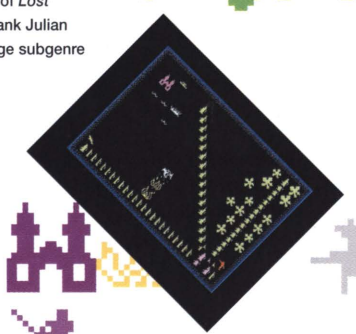
Original format: **ZX Spectrum**
Publisher: **Games Workshop**
Developer: **Julian Gollop**
Origin: **UK**
Release date: **1984**



Julian Gollop was always a board game fanatic ("Ever since I was 14 or so.") and *Chaos*, like his other earlier titles, was based upon his own design for a more traditional card game. He used to design them obsessively and saw computers as a way of hiding more rules in the game: rules that would 'feel right' but be too complicated to be worked through in a pen-and-paper scenario, and so would allow for a richer playing experience.

For someone who's been designing and tweaking these video/board games for over 20 years, Gollop, the man largely responsible for the successful *X-Com* series of games, doesn't see the point in playing the same rules for too long, and refuses to rest on his laurels: no





Those experiencing the delights of *Lost Kingdoms* on GameCube can thank Julian Gollop for kickstarting this strange subgenre

set of rules is perfect or sacrosanct, no game is too precious to tinker with.

Ardently admired

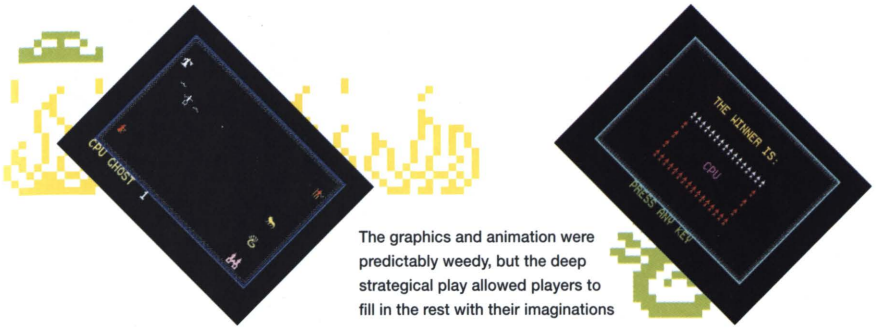
"According to some of my colleagues, and many other people who have played it, this is the best game I've ever done," he seems to sigh on his company Codo Games' Web site, recounting *Chaos* as the fifth in a line of strategy games that he wrote. It's not a sigh. In fact, when asked in person, he's proud of the game. "It was definitely the most ardently admired out of everything I've done." But *Chaos* was actually based on a card game he'd cobbled together out of an early Games Workshop board game called 'Warlock'. "It was kind of a wacky title… we used to play my version of it every Christmas until, well, actually only a couple of years ago. It had a board but the board just seemed pointless… I wanted a map and a sense of location. *Chaos* emerged out of that card game."

The rules of *Chaos*, then: each player represents a wizard, and is dealt a number of secret 'spell cards' with which to play the game. Every turn each wizard can cast a spell, move their creatures around, and try to attack other wizards on a rectangular board. Spells can create creatures to fight for the wizard (dragons, giant rats, zombies), some can be used to strike opponents directly (lightning bolt, fireball) and others had more esoteric effects – for instance, to mix up all the pieces on the board. ("There was a bug where that one only turned up once in every 64 games, so it's pretty rare… but that's probably a good thing.")

Each spell has a chance of failing. Spells that create creatures can be cast as illusions, which never fail, but other wizards may cast a 'Disbelieve' spell on illusory creatures to make them vanish. The wizards take turns to summon minions and set them against each other until only one is left standing.

Although each player starts with 13 spells, some will fail, some will just not be the right spells at the right time and some will only prolong your wizard's chances of survival rather than be of any direct offensive use. The upshot of this is that the game can never quite degenerate into a fireball-hurling competition because when it can be over in 15–20 turns, every move is significant and must be turned to maximum tactical advantage. But importantly the game does not force this on you. The player can play it as a quick blast, hurling the most destructive spells as quickly as possible, and still enjoy the experience against similarly minded players or lower-powered computer opponents.

Speed was the game's lure, and soon you found you were plotting your moves more carefully, putting on an illusory air of nonchalance as you wondered that maybe, just maybe if your giant bat could last a turn against your opponent's green dragon, your wizard stood a



The graphics and animation were predictably weedy, but the deep strategical play allowed players to fill in the rest with their imaginations

chance of acquiring a fireball spell from the nearby Magic Wood and be able to finish the beast off. These thoughts must have been the tip of the iceberg for an average Gollop family Christmas.

After doing most of the design for his card game, Gollop confesses that a lot of the design decisions for the computer were down to what would fit on the screen: 13 spells, an 11-by-7 playing area. "Although converting any board game's rules precisely to a computer screen is kind of a pointless activity… some people might enjoy it but it's not something I go for."

Dubious honour

Chaos was released originally in 1984, after only a month's programming (although not bad considering this was Gollop's first experience of programming for the Spectrum) and had the dubious honour of being one of the only videogames marketed by Games Workshop, the fledgling board game manufacturer. It was the only title it released which wasn't a conversion of one of its board games. Gollop's (then) group of programming allies, Redshift Software, had a fairly close relationship with GW, including some mixed conversions of other favourites such as 'Talisman' and 'Battle Cars'. In fact, Gollop turned down an offer to convert a presumably lucrative Judge Dredd licence because "they just wanted some mindless sideways scrolling shooter… not very interesting." However, Games Workshop's efforts to push videogames exclusively in its own stores was probably doomed by the relatively small size of the videogame market in the UK, which needed every possible retail opportunity, and it abandoned game publishing after relatively few titles (as Gollop says, "They only had about eight stores back then; how did they expect to sell computer games?"). A budget re-release in 1987 by the Firebird Silver range attracted far more attention, and 'Your Sinclair' gave the game away on its cover tape twice in 1989.

Chaos fans over the years have made a Java version, a 3D Windows version and even a very decent Game Boy Advance version, testament to the game's continuing popularity and the affection with which it is held.

For all the frills, *Chaos* is still a board game, however Gollop hit upon what it was that stopped people playing such games: "Most games were – well, still are – clones of *Space Invaders*," where any innovation in technology was as impressive and exciting as a pedestrian-looking, but playable game. To see the innovation in *Chaos* is to see the fusion of two different types of play: one was the strategic thinking and slower pace of board games such as 'Risk', 'Diplomacy' or even 'Go', a mode of play which was picking up cult popularity thanks to young companies such as Games Workshop and Steve Jackson Games. The other sort was the unique fast-paced world of play that a computer could provide: where the same precise and fair calculations of routine wins and losses could be worked out instantly to provide a richer sense of immersion to the player.

Dim memories

When the need for swift reflexes is taken out of the traditional arcade game, much more depth can be extracted from it without removing the excitement of the player being able to shape their own drama. Gollop's latest incarnation of the *Chaos* formula is a game which can be played by email over days, and players can plot their moves with immense precision for hours, simulating the arcade action in little chunks; each turn lasts only ten seconds of 'realtime', and an immensely satisfying game can be played back with the video-style 'replay' controls over several minutes, every twist and turn in the action packed with players' strategic thinking rather than dim memories of button-bashing.

Although *Chaos* did not have such a replay feature, the game still showcased the idea that a board game need not be a turgid series of moves represented "like a spreadsheet", as Gollop describes one of his earlier games. In *Chaos*, the pieces onscreen moved while you stared at them, planning your next turn. Arrows and fireballs zipped across the screen as the game progressed, and wizards met their end in a shower of of chunky Spectrum colours. *Chaos* had the intricacies of a board game combined with the speed and flair of a contemporary arcade game. Requests for an official update to *Chaos* still trickle into Gollop's mailbox, but why tempt him to tinker with a good game?

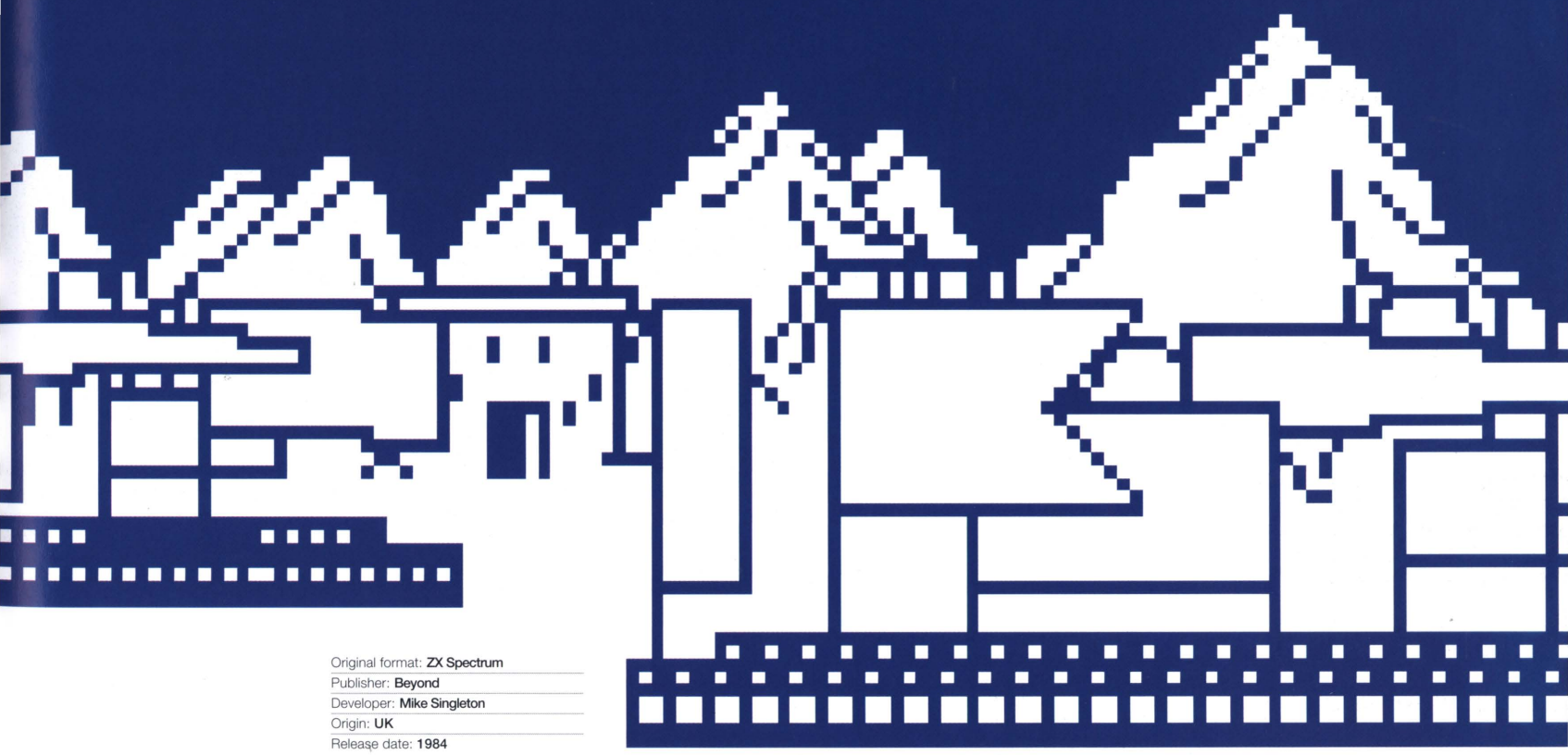
Lords of

Lords of Midnight was truly a thing of beauty. Its icy wastes, craggy citadels and distinctive deep blue sky brought a dimension of style to the ZX Spectrum of 1984 which served to dignify, rather than trivialise, videogames. And, like all the games which alter the way we think about electronic entertainment, it wouldn't fit neatly into any given category. Strategy, RPG, text adventure – it was all of these and something quintessentially more. An independent universe which would leave a residual trace in the memory of all those who traversed its furthest reaches.

The goal was straightforward: to overthrow the evil witchking, Doomdark, and restore stability to the land of Midnight. The execution was somewhat more complicated, as sole creator **Mike Singleton** explains: "I wanted to allow the player to explore and discover new places and new allies in a game environment that had the breadth and depth of a real country. The vital seeds were the map and the story; with those two elements finalised everything else very quickly fell into place."

Midnight

Coder Mike Singleton breathed life into huge, convincing gameworld Midnight, stunning a generation of gamers in the process. **Edge** talks moonprinces, witchkings and cassette tapes with the man who fought the Spectrum – and won



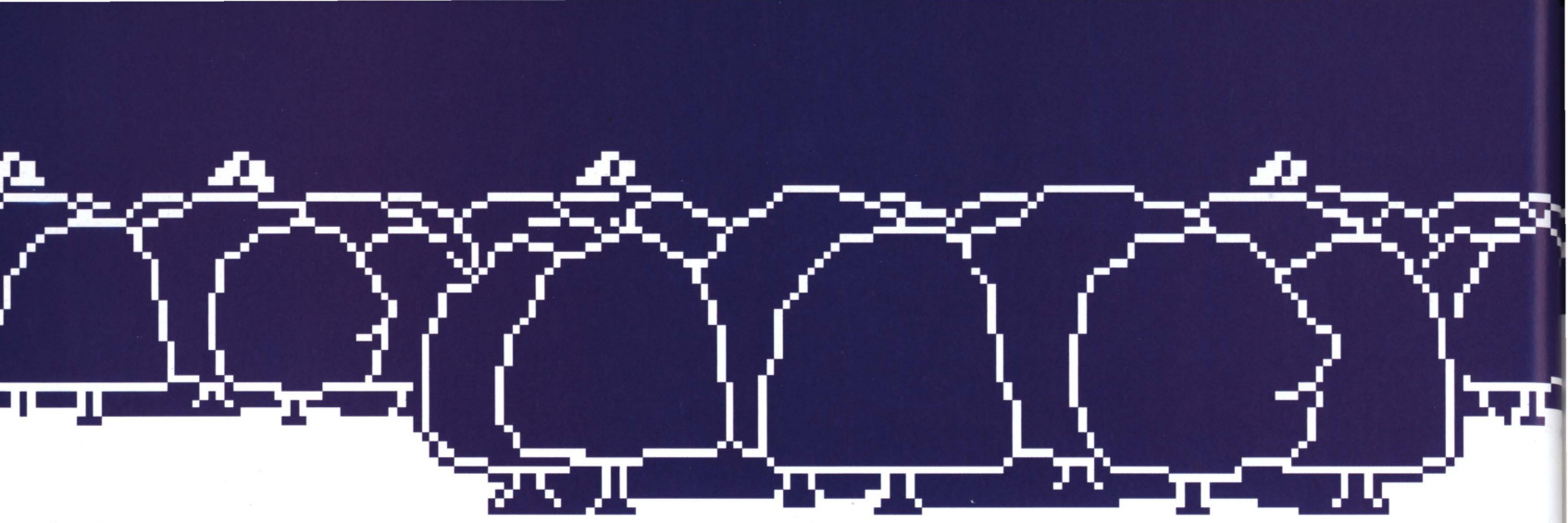
Original format: **ZX Spectrum**
Publisher: **Beyond**
Developer: **Mike Singleton**
Origin: **UK**
Release date: **1984**

Singleton admits to Tolkien's influence, yet *Midnight*'s narrative certainly had its own power to captivate. Four characters were playable: Luxor the Moonprince; his son Morkin; Rorthron the Wise; and Corleth the Fey. Each character could be moved independently around the vast world, recruiting armies and battling creatures. Doomdark's own 250,000 Iceguard warriors were determined to hunt down and kill your men, and had the dreaded Ice Fear on their side – a terrible psychological power which could sap an army's motivation to fight.

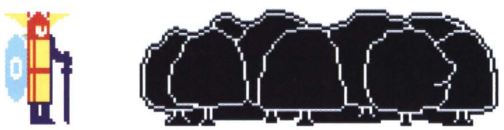
However, the allies had two powerful weapons. Luxor owned the Moon Ring, which gave him powers of command and vision. This enabled him to direct all the other characters. Morkin, meanwhile, could totally resist the Ice Fear, giving him the opportunity to seek out and destroy the Ice Crown (Doomdark's power source) at the Tower of Doom in Ushgarak. In this way two strategies could be employed to win the game: the military campaign with Luxor, or the stealthy approach with Morkin.

Singleton's vision was ambitious, and he would have to apply his programming skills towards organising and calculating vast armies across a map consisting of 4,000 independent locations with 32,000 separate views. Though movement commands were simple enough (typing NE, E, SW, etc), the player would have to consider when to rest, when to recruit, and which terrain to attempt to negotiate. Each had a significant effect on the player's forces status. Interestingly, the adventure game *The Hobbit* provided the motivation for the technical intricacies. "It was one of the very first adventure games to include pictures, and I was suitably impressed by it," says Singleton. "But two things struck me about the graphics. Firstly, although the cameos and landscapes were nice, they were purely decorative – they had absolutely zero function in the game. Secondly, it took ages for the graphics to be drawn, and I mean ages – not half a second or maybe a whole second, but one minute, maybe two."

The limitations of the Spectrum's 48K memory and difficulty in displaying colours would actually define *Midnight*'s stark visuals and gameplay mechanics. "I described [to



Luxor the Moonprince



He slew the wolves. Four hours of the day remain and Luxor is utterly invigorated. The Ice Fear is very mild. Luxor is utterly bold. He has with him the Moon Ring.
He thinks again....

Luxor needed to be protected at all costs. Should he die then the Moon Ring would fall into the enemy's grasp, who would then control his armies

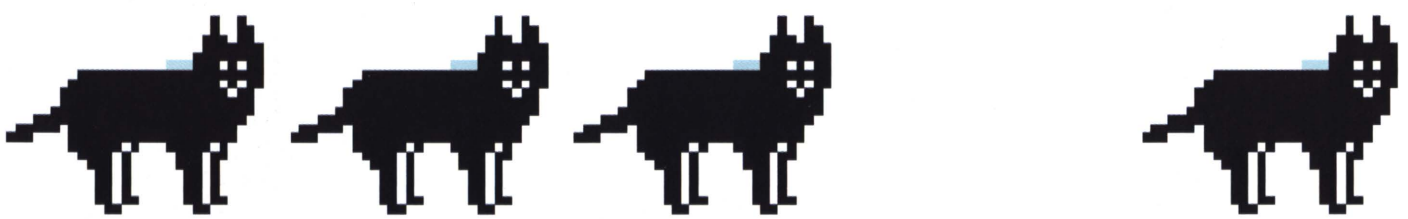
Beyond Software] my idea of 'landscaping' – 3D panoramas which would be composed and drawn realtime by scanning a map of the game world and using scaled graphics for each of the landscape features. The graphics were all drawn directly to screen using the graphics utilities I had written and were largely dictated by the limitations of the medium. I wanted all of the characters to be bright and colourful, in contrast to the uniformly blue-and-white landscape. But on the Spectrum, you can't colour individual pixels, you can only colour whole 8x8 pixel cells – a maximum of two colours per cell. This means that the characters had to be designed so that their colours fit to the cell boundaries, but also so that they don't end up looking like Lego bricks."

Due to *Midnight*'s complexity, the project had to be meticulously planned from the start. "The real key was not to write the game first and then try to compress it, but rather to write the game in compressed form right from the word go. I knew the landscape graphics would take up a lot of memory, so the first couple of weeks were spent writing routines that used a specially modified form of run length encoding and decoding for these graphics, as well as some utilities in BASIC that would enable me to interface with a graphics tablet and automatically scale and then manually touch up the landscape features I had drawn."

Singleton was adamant that the game was not to be about merely wandering around and admiring the scenery. Much thought went into creating the characters and creatures to support the over-arching concept. Small details would prove to be significant once the player was submerged into the game world. "The data that the map had to store included landscape features, armies, place names, magical objects and creatures such as wolves, dragons, wild horses, skulkrin and trolls. Each of these was encoded with the absolute minimum number of bits," explains Singleton. "The creatures, for instance, were stored in just one bit per cell. That bit said whether there were creatures there or not. Then a number-scrambling routine told you which type of creature it was by scrunching up the map coordinates of the cell. Likewise, all the text in the game was tokenised using a one- or two-byte code per word, and the words referred to were further compressed by using only five bits per character."

Other technical headaches were to give Singleton more late nights. The 48K memory capacity was just too limited to contain all the code. As Singleton stresses, every spare byte had to be conserved if Morkin and Luxor's quests were to run with any degree of success: "The code itself was kept manageable by using short subroutines for almost any piece of code that cropped up more than once. Nevertheless, it was only on the third rewrite of the code that I finally managed to fit everything in. By that stage you are reduced to expedients such as rearranging the order of subroutines so that a routine that calls another as its final call is instead placed immediately before the called routine. You can then remove the call instruction and the return from subroutine instruction, and allow the first routine to drop through into the second. This saves four whole bytes."

Dealing with ordering routines was commonplace in BASIC. More exacting still was dealing with the Spectrum's infamous storage medium – the cassette tape. "*Lords of Midnight* was designed, assembled and tested entirely on cassette tape, which was almost as slow to load as *Windows 2000* is to boot up your PC," recalls Singleton. "I still have a cardboard box at home full of 100 five-minute tapes which comprise the source code and the graphics of *Lords of Midnight* and all the back-ups and back-ups of back-ups. The code itself had to be split up in ten different segments, each with its own little tape, and each with its own declaration of variable and subroutine addresses from the other nine tapes (and all typed in by hand). So, each of the rewrites involved changing each of the ten segments, strictly in order, because the address changes in the first would have a knock-on effect through all



the subsequent segments. Things like that make you very careful with your back-ups and your labelling of tapes."

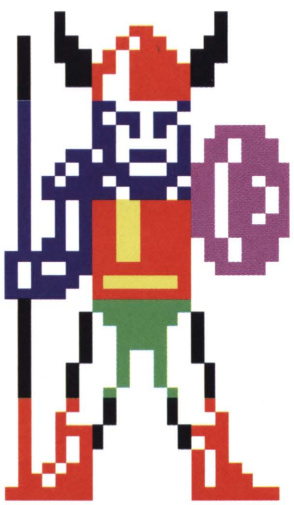
Terry Pratt at Beyond Software saw the game universe coming together and had great faith in the project. He organised a three-month teaser campaign in magazines, and when the game was finally released it was met with an 'ecstatic' response. The only negative feedback Singleton remembers was at the press launch for the game: "I'd been demoing the game to journalists all afternoon in the bowels of some club in London and we were about to start dismantling the equipment when a prominent game journalist of the time swayed in, somewhat the worse for wear after a very long liquid lunch. He staggered over, and after about 30 seconds of watching the game pronounced, 'Tha'sh a pile of shit', and immediately left. With that seal of approval, the game became an instant smash hit."

Very rapidly, the game began to attract a core of passionate gamers who would send fan mail concerned with the most trivial or groundbreaking detail of the game into the videogaming magazines of the time. "The thing that did surprise me was how quickly some people managed to beat Doomdark," admits Singleton. "In less than two weeks someone had sent in a winning printout to Beyond (you could print out a scene-by-scene record of your game on the Spectrum's thermal printer). I had estimated at least a month or two. When I was testing the game it took me nine solid hours to gain a military victory against Doomdark, and I had all the maps and data to help me. We reckoned there must have been some fanatically dedicated people out there."

Singleton has spent most of his working life in the industry, bringing other well-respected titles into the world such as *Midwinter*. When asked if he preferred the self-sufficient days of 8bit coding to today's two year development cycles and publishing stresses, he expresses a complete disregard for nostalgia: "Would I rather be programming *Lords of Midnight* on a Spectrum or *G-Surfers* on a PlayStation2? Don't be silly. The new technology is even more exciting than the old was, even in its day. Our imaginations are still racing to catch up with what's possible now. There's so much more scope for creativity now. In five or six years' time, there will be categories of game no one's dreamed of."

The legacy of *Midnight* still lives on. *Doomdark's Revenge* (1984) pushed the Spectrum architecture even further with its 48,000 panoramic views – one full screen for every byte – and *The Citadel* (1994) brought realtime voxel rendered landscapes to the PC. Plans are even afoot to bring the fourth instalment of the game to the new generation of consoles. But wasn't *Lords of Midnight* a shining example of creativity blossoming because of, not despite, hardware limitations? Some might argue that the PlayStation2 may never have every ounce of its power utilised to such creative effect as displayed in Singleton's seminal title.

Doomdark could win in three ways: kill Morkin, kill Luxor, or capture the Citadel of Xajorkith, Luxor's base. Defending and attacking were both vital



Elite revolutionised gaming with its 3D graphics, expansive game world and balanced blend of space trading and combat, transforming the lives of young programmers Ian Bell and David Braben in the process. **Edge** traces the story of its development, and how it was nearly never published

When someone unfamiliar comes knocking on your door at ten o' clock in the evening dripping with rain and weary after travelling the 300 miles from Liverpool to Cambridgeshire, you know you are in the presence of an obsessive. Questions including: 'In which galaxy can the Generation ships be found?' and 'Just how many stars make up the whole game universe?' only serve to re-establish the weird world of fandom into which **David Braben** and **Ian Bell**, co-creators of *Elite*, must occasionally warp.

Elite spawned the first ever Internet user group, and eventually docked on to 17 separate formats. The game established Braben and Bell as coding heroes to the next generation of programmers. It also brought them early fame, extensive news coverage and an amount of money no number of narcotic runs between Wolf II and Lesi could have garnered. The *Elite* story began in typically humble surroundings: a tiny dormitory at Jesus College, Cambridge, Earth.

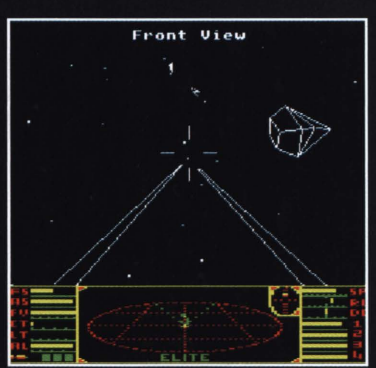
"*Elite* was substantially written during the summer holidays when I was at university," reflects Braben. "I was 19 and Ian 20. I wanted to do a 3D space game since time began and I had a little Acorn Atom PC that was largely built at home – I'd already programmed this 3D expanding star field which included a few spaceships." Though Braben and Bell have since fallen out over the rights to the *Elite* brand, he is candid about their initial relationship and early friendship: "Ian was doing Maths and I Physics. When I saw his BBC Micro it was like, wow. We got really excited about programming and at that point he was already coding a game called *Freefall*."

Bell's recollection of the genesis of *Elite* is somewhat different: "David claims to have been planning a 3D space game on the Atom at the time," he tells **Edge**. "Peter Irvin, who had written *Starship Command*, and later *Exile* for the BBC Micro, was talking about a space trading game. It was the obvious thing to attempt." After lengthy discussions and some experimental coding, a 3D space combat game began to emerge. It would be called *The Elite*. Revolutionary vector maths, huge areas of space to explore and frenzied action, however, did not satisfy the two Cambridge undergraduates. "It felt very empty," continues Braben. "When you played it for a bit it felt pointless. To make it a satisfying experience we had to have some motivation. That's where the trading game came from." Ironically, both Braben and Bell agonised over this aspect for a long time. "We were both afraid that it would actually be a boring component. But in a sense it gave you the contrast – the relief in between the tense combat."

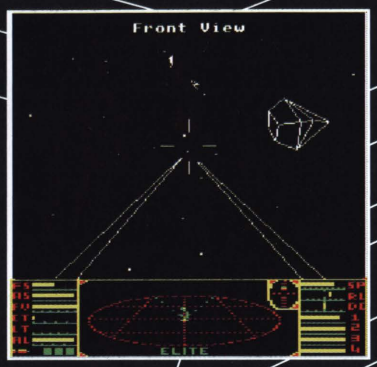
The game was rebranded as *Elite* and the real grit and grind of producing the expansive and unique game universe really began. "I suppose it was the real bedroom coding scenario," recalls Braben. "We each worked separately on different sections and then amended sections by fixing or tuning." Working in tandem speeded up the process yet the dangers of replicating key code had to be studiously prevented. "We were just very disciplined about keeping records of what we changed," he continues.

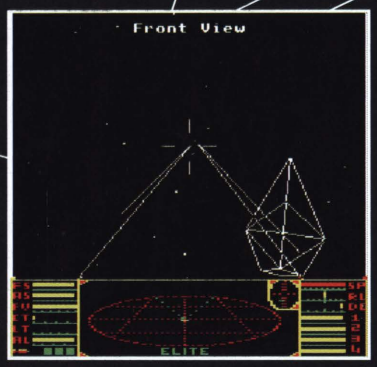
The game naturally pushed the BBC Micro to its limits and the headache of compressing all the data down to 22K proved a constant struggle. Yet Bell recalls that first magical moment when he knew he had something special: "It was the first time when I tested the movement and rotation routines together with the tactics code and actually saw some Vipers moving in 3D – that was special." Though Braben always considered *Elite* more of a hobby than a business venture, the toll of long nights at the keyboard did begin to eclipse his Cambridge studying. "I delivered the master disks one week before my exams," he ruefully tells **Edge**.

Elite's success is now well established. Bell estimates that some 600,000 copies were eventually sold. The game was released in 1984, cost £15 – expensive for the time – and went into a production run of an unprecedented 50,000 copies (only *Revs* had previously managed to sell 30,000 units). The national press soon picked up on the phenomenon and both authors employed an agent. Yet early code had been turned down by some of the big players of the early '80s. "I first submitted *Elite* to Thorn EMI in London, and in a letter which I still have they said they didn't want to publish it," explains Braben. "To be honest it was one of those moments when



Dogfighting (left) was tremendous – get too close and enemies could launch unavoidable missiles. BBC Micro version only: the elusive Generation ship (right) was only seen under certain conditions





Perhaps the most innovative feature of *Elite* was the opportunity to trade across eight vast galaxies. It added a depth and durability still unsurpassed in today's market. Steady food and mineral trading would soon turn to narcotics and firearms when greed took over

I thought, my God, they might be right.'

This maverick space trading game broke every conceivable convention. *Pac-Man* and *Defender* clones ruled the videogame industry. Who would want to play a game which had no recognisable goal and committed the blasphemy of having no points total? "The reasons they cited were all true," concedes Braben. "But ironically they would turn out to be the strengths of the game." Among the criticisms levelled at *Elite* were that it was too long, required save positions, used vector graphics, and wasn't colourful enough.

Undeterred, Braben and Bell returned to their task of studying by day and programming by night. A few other publishers were tentatively approached before *Elite* finally generated the gasps and exclamations so common among gamers when they first piloted the Cobra MkII. "We went to Acornsoft and fired up the game on their BBC Micros. We instantly had a crowd. It was two-deep within minutes because of the open-plan arrangement. I knew then there was no question as to whether they were going to publish it," remembers Braben. Acorn, however, was not completely happy with every single design feature. Incredibly, *Elite* was an even more extensive game back in '83. The eight galaxies which became standard on all versions originally numbered two to the power of 48 – literally hundreds of thousands of billions. "Ridiculous numbers of galaxies," reflects Braben. Speaking about the decision to drastically curtail the *Elite* universe, Braben remains philosophical. "I like the idea that you're in a Douglas Adams-type universe – an insignificant dot on an insignificant dot feeling – but you don't want too much of that sort of thing."

The inclusion of gun running and narcotics was also a potential sticking point with publishers – Thorn EMI had emphatically said so in its earlier rejection letter to Braben. Acorn eventually came round to the idea after much persuasion, but the potential controversy of buying and selling narcotics for a profit would hang over the team until the first sales figures were returned. The inclusion of such elements are tame by today's standards, and *Elite* can at least be defended on the grounds that a moral choice must be made. "The idea was that you could get a much better benefit from carrying narcotics," replies Braben, "but, of course, you've got the downside of police intervention."

Acornsoft must also be credited with a great deal of the praise for the early impact of the game. A competition was devised based on the concept of becoming the best – the Elite. The competition was run at the end of each month after release, for six months. Results were published in the most popular games magazines. The play-off between the six winners went on to the grand final at the Acorn User Show. Not only was it the first home videogame-related competition of its time, but more importantly it became an early anti-piracy measure. Looking back, Braben marvels at the way the competition prevented lost revenues to the pirates. "It was very interesting actually, chatting to people who had entered. I asked them, 'Did you buy the game?'. 'Erm, no,' they said, 'but when I realised I was in with a chance I thought, right, I can do better than that'. They went out and bought the game just to get the entry card."

> "*Elite* was substantially written during the summer holidays when I was at university. I was 19 and Ian 20. I really wanted to do a space trading game. It was the obvious thing to attempt"

Channel 4 News quickly picked up on the phenomenon. An experimental starfield with vector graphics had suddenly become national news and was being played by just about every teacher and child who had access to a BBC Micro. One story suggests that the then ITN News editor went down to the news room and found nearly every journalist playing *Elite* on their terminals. Braben replays the scene: "'What the hell's going on?' asks the editor. 'Don't worry, we're just playing a game'. 'No, why is everybody playing the same game? This is a news item in its own right!'"

The report was broadcast at peak time, and Braben acknowledges the boost it gave the game: "Both Ian and I were looking embarrassing in our student attire, but we got some brilliant quotes from it. Peter Warlock, who was then the editor of *PCN* magazine, said, 'It's the best game since… it's the best game ever!' That was really nice. He didn't imagine it being bettered in the sense of the impact it had."

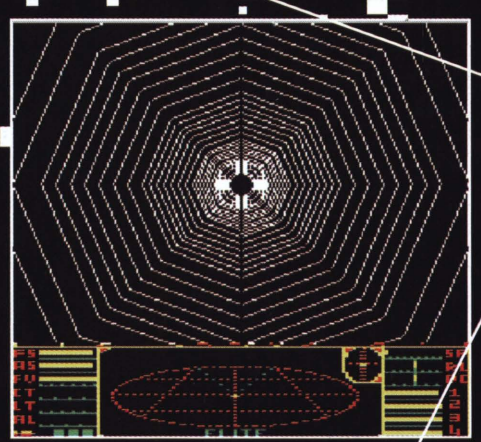
When asked about the fortune made on the back of one of the most influential videogames ever, Braben remains predictably guarded. "It went from hardly having two pennies to rub together to talking about potentially very big money," he says. "Although people don't realise it's actually a long time before the money actually followed on." In a brave and perspicacious move both Braben and Bell kept a firm hold on the *Elite* brand. The move would prove to be a foresighted business decision. "We gave Acorn the rights to just the BBC Micro platform," recalls Braben. "They didn't realise we were serious about it, because I withheld not just the game rights but the film rights too. I think that they had not realised quite how valuable the other platform rights would be."

Though the popularity of *Elite* seems not to have come as a huge shock to the two authors, the sudden media attention and change in lifestyle did take some adjusting to. "You see these programmes on TV about lottery wins and how people can't handle the changes in lifestyles," ventures Braben. "There's truth in that. *Elite* was like a lottery win because although we had worked hard, it was still a hobby. It was never a money-driven thing. It eventually caused a rift."

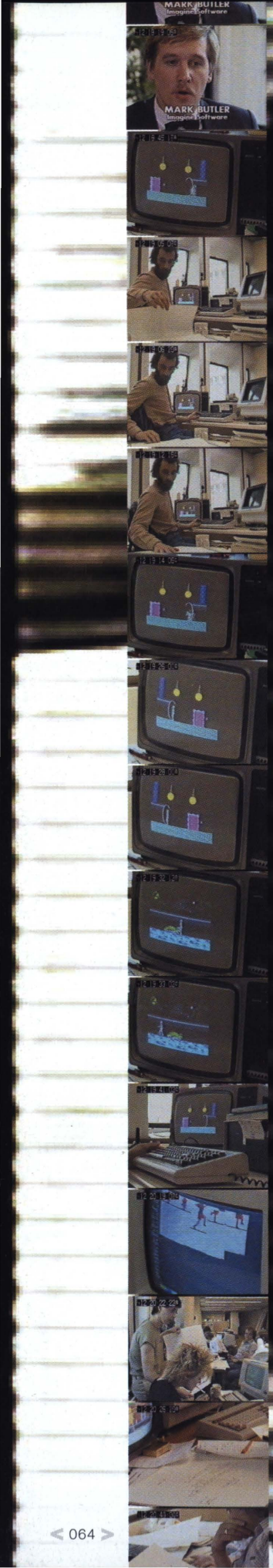
The rather unconventional fame which came after *Elite* still remains with the two coders. Bell dedicates a Web site to the game, and is more than happy to indulge anyone still interested in queries about the space dredgers or how to avoid witch space. Braben, too, is sometimes uncomfortable with the attention over a 16-year-old videogame: "I was at a party a fortnight ago when someone asked for my autograph and it's a bizarre feeling. Then two other people wanted it. As far as parties go its an honour but it does begin to separate you off from the other people there."

It is unlikely that fanatics turning up on either programmers' doorsteps to discuss the finer points of this space trade game will

ever really go away. The game was played by too many people for too many hours and at such a formative time for it to fade away into obscurity. One frightening thought is that *Elite* probably affected a huge proportion of the population at some stage and in some way. As Braben acknowledges: "So many people approach me and say, 'I failed my exams because of you'. But more say, 'I got into the industry because of you'."



Even warping could be a tense affair, with the chance of meeting Thargoids in witch space – if you were out of fuel it would be curtains for your commander


MARK BUTLER
Imagine Software
MARK BUTLER
Imagine Software

Bandersnatch

It was to revolutionise early-'80s gaming: "Every other Spectrum game will become obsolete overnight," was the claim. But *Bandersnatch* is remembered for a very different legacy than those who worked on it could ever have expected...

When Psygnosis released *Brataccas* for the Atari ST in 1985, the beginning of an era for the Liverpudlian firm was a footnote to the story of infamous 8bit publisher Imagine. *Brataccas*, you see, was the game that was formed from the husk of code left over from Imagine's so-called 'Mega Game', *Bandersnatch*: the UK industry's most famous game that never saw the light of day.

There were to be two Mega Games – *Bandersnatch* for the Spectrum and *Psyclapse* for the C64. Both were the brainchild of David Lawson, a coder turned director at Imagine. Declaring, with customary ambition and enthusiasm, that his programmers had reached the limit of the Spectrum's and C64's abilities, he proposed a novel solution: hardware add-ons, sold hardware add-ons, sold with and facilitating games with unprecedented visual flair and state-of-the-art design.

Original format: **ZX Spectrum**
Publisher: **Imagine**
Developer: **In-house**
Origin: **UK**
Release date: **n/a**

The speech bubbles system, such an integral aspect of the original *Bandersnatch* design brief, plays a similarly significant part in *Brataccas*. However, it was ruined somewhat by some awkward overlapping

Conceived at the end of 1983, Imagine began work on its Spectrum-based Mega Game in early '84. Its development team of four was astonishingly large for the time – **John Gibson** (now at Warthog) and Ian Wetherburn (sadly deceased) coding, with **Steve Cain** (Tin Tiger) and **Ally Noble** (Rage) fulfilling principle art duties. *Bandersnatch* was designed as a flick-screen adventure set in an intergalactic nightclub on an asteroid, its buildings linked by glass tubes. Eschewing combat, its gameplay was to involve interacting with various AI-controlled characters via speech bubbles.

"It was supposed to be a game where you wandered around a free environment and interacted with people, which was unheard of at the time," recalls Steve Cain. "Balloons would pop up with speech in as you did so, and you worked out clues from what they said and the questions you asked them. I can't remember actually what it was about now – I think it was some kind of tale of revenge and murder."

For perspective, it's worth pointing out that Ultimate – one of the most technically accomplished Spectrum developers in 1984, the year of *Knight Lore* – was working on maze game *Sabre Wulf* at this point. "I was working on the engine, Ian Weatherburn was working on the speech bubbles," explains John Gibson. "That was actually quite a complicated idea for the time. It wasn't just going to be set strings just stored away somewhere. There was going to be some sort of system that made up answers to questions. The idea was to make a game that was different every time you played it."

The hardware add-on

Such features could certainly have been achieved on a basic Spectrum, but it was the much-vaunted aesthetics of *Bandersnatch* that necessitated the use of a hardware add-on. Despite laughable claims in the press that this device increased the power of Sinclair's machine by ten or 20 times, it was actually, Gibson told **Edge**, a fairly simple ROM device of either 128K or 256K on which code could be stored. For the artists, this was plausibly more room for graphics than they had been afforded in Imagine's previous releases combined. "Oh yeah. The more, the better!" laughs Ally Noble. "I can remember doing the animation for it. I must admit, having had all these wonderful ideas about what it might be like, though, the reality of it was that we still only had about 16 frames to do the walk and the run of the main character. That wasn't that much different than what we'd had before – perhaps around eight frames."

The problem, however, was that the plans of David Lawson and his Mega Game team were too ambitious, even with extra memory. "Most of my work was messing around, trying to make it all fit," Gibson chuckles. "That was the trouble. It soon became clear that the extra 128K, 256K, or whatever it was, it just wasn't going to be enough. We'd spent months and months working on it, and it became apparent that the form it stood in just wasn't going to fit in. All the graphics would have had to be redone. Dave Lawson always thought big – he'd wanted big, big, big from day one, and there just wasn't space."

Cain remembers this situation keenly: "The problem was that we didn't have the graphics finished. We had all the backgrounds in, all the maps working, rooms for three or four sprites, and no RAM left whatsoever [laughs]. We were talking about putting extra sprites on the tape as well. Some of it was going to be ROM, some of it was going to be RAM."

Looking back at old Spectrum magazines of the time, it seems there was an inverse proportionate relationship between Imagine's health and its claims for *Bandersnatch*. Director **Bruce Everiss** was quoted as claiming that "*Bandersnatch* will make every other game obsolete overnight." Its cereal box-sided packaging would contain, 'Your Spectrum' related in its August '84 issue, a music tape, posters, tokens, toys and, of course, the requisite peripheral. The price also increased from the level originally mooted: once £20–£30, later reports fixed it at £40. In actual fact, the final price under discussion at Imagine was even higher. "It looked like it was going to cost in the region of £64 or something," Gibson confides. "They'd have had to sell it for £64 just to break even. Who was going to pay that for a Spectrum game?"

The death of Imagine is documented in greater detail in **Edge** 118's Game of Chance feature, but it soon became apparent to the team that the troubled production of *Bandersnatch* was the least of their worries. "We were the Mega Game team, and we were kept separate from everyone else," says Noble, "but I can remember a really bad meeting where we were asked to leave the room, and everyone else was being given their marching orders."

Before long, even the Mega Games team would be out of a job. "The company was in the shit. Everybody knew that it was absolutely fucked, not to

"It looked like it was going to cost in the region of £64 or something. They'd have had to sell it for £64 just to break even. Who was going to pay that for a Spectrum game?"

put too fine a point on it," says Cain. "Dave Lawson firmly believed that they had some money coming in from the States. There was even talk of us working with Atari. The idea was that Atari would foot the bill for the people on the Mega Games team to go live and work in California. Apparently, at the last minute, Warner Brothers – who owned Atari – sold it to the Tramiels, and the Tramiels were supposed to have said, 'No.' And that was the end of that."

In Paul Anderson's 1985 BBC documentary on Imagine and Ocean, there's a poignant moment – just before the end, when the bailiffs arrived – where Bruce Everess talks to the camera about a practically deserted office. "As you can see, it's fairly empty," he says sotto voce. "A lot of people are going to the pub quite early these days. They've had the video cassette recorder playing this morning – they've all been watching 'An American Werewolf in London'. You can see they've been making flags and decorating the place generally, instead of doing work, because… well, why bother? They know there's no point."

With Imagine's demise, Gibson, Noble, Cain, Wetherburn and a few additional colleagues discussed forming their own development house. Despite a lack of early encouragement – "Dave Lawson was saying, 'If you get two grand a game, you're doing well, boys.' When we went to approach Beyond, they said, 'We'll give you 20,'" recalls Cain – the *Bandersnatch* crew became the core of a new company: Denton Designs. Their individual reputations enhanced by work on *Bandersnatch*, David Ward of Ocean bought their old development kits from the Imagine receivers for Denton Designs in return for a game within a short timeframe – *Gift from the Gods*. They also had the contract with Beyond for an icon-driven strategy title, *Shadowfire*, and would become in time one of the UK's most fondly regarded (and now, well remembered) 8bit developers.

Meanwhile, work continued on *Bandersnatch* at Finchspeed, a company formed by Imagine directors Ian Hetherington and Dave Lawson. It was widely reported that the ill-fated Mega Game was to become a launch title with Clive Sinclair's QL, the add-on pack discarded in favour of using Sinclair's Microdrive storage system. The QL reached store shelves, and stayed there. *Bandersnatch* was nowhere to be seen.

It may seem a mite embarrassing and even surreal by modern standards, but the advertising of *Bandersnatch* (and C64 stablemate *Psyclapse*) was remarkable at the time. The promotion of dev staff is worthy of a wry smile (and, for a select few, a cringe). Incidental trivia: Psyclapse became the name of a Psygnosis sub-label

Unfinished business

"Because it was such a big game, *Bandersnatch*, I wonder if it would have been any good if we'd finished it?" ponders Cain. "We were working in the dark – we hadn't done that kind of thing before, nobody had. Some of the environmental things were interesting, and the fact that the characters were going to interact with each other, but that wouldn't have necessarily made it much of a game."

The answer, in many ways, lies in a five-minute sitting with *Brataccas*, the first game published by the firm Ian Hetherington and Dave Lawson founded after the short-lived Finchspeed: Psygnosis. In very many respects, it is *Bandersnatch*. It has the speech bubble system, large sprites, a flick-screen map, autonomous AI-controlled characters, a lack of 'action', and is based inside a facility on an asteroid. It also has one of the worst control systems ever coded, which is at least part of the reason for its low profile – magazine reviews were lukewarm or overtly critical, apparently. People liked its ambition, however. Even by 1985, it was a distinctive title, albeit a poorly implemented one.

The fact is, *Bandersnatch* means more to gamers and the industry alike as a high-profile cancellation than it ever would have as a release. Its demise, and that of Imagine, gave life to Denton Designs and Psygnosis: how different might the gaming world be without the *Bandersnatch* project? It might not have rendered every other Spectrum game obsolete, or even existed as a finished game, but its legacy is tangible to this day. And how many games can boast that?

The original *Bandersnatch* setting was a nightclub on an asteroid, which explains *Brataccas*' many bars. The colour scheme, it is said, reflects its time in development as a Sinclair QL game

Original format: **Electronica 60**
Publisher: **n/a**
Developer: **Alexey Pajitnov**
Origin: **Russia**
Release date: **1985**

Tetris

Edge talks to **Alexey Pajitnov**, the man behind the most compulsive videogame ever, and finds out all about *Tetris*'s troubled genesis, its hideously convoluted licence history, and just why he shows absolutely no remorse for the people whose lives the game 'wrecked'

At an otherwise humdrum arcade trade show in June 1988 Minorou Arakawa, the president of Nintendo America, saw *Tetris* for the first time. Among the noisy beat 'em ups and driving games stood a machine in stark contrast to everything else. It was designed in Russia, emitted meagre sound effects, and featured a few basic shapes falling down the screen. Gripped by curiosity Arakawa tried the game and was instantly hooked. More importantly, he had discovered the title Nintendo had been desperately searching for: a killer app to fuel demand for its newly constructed handheld system. Since 1988 Nintendo has sold an incredible 120,000,000 Game Boy units. Unarguably, *Tetris* played the most significant role in the format's success.

But the real *Tetris* story began in a cluttered and overcrowded computer lab back in 1984. **Alexey Pajitnov** was a Russian researcher working on artificial intelligence systems at the Moscow Academy of Science when he hit upon the *Tetris* formula. "Alongside my regular job I had a special interest in everything which had some relationship with computers and the human mind," he recalls. "I did work with psychologists and I tried to invent creative appliances with computers. The games were part of this general interest. I loved to make small games and puzzles."

Pajitnov had already created several logic applications with his Electronica 60 computer, but the significant breakthrough came when he discovered a game called Pentominoes in a local toy shop. "It is a box with all different shapes formed around five squares," he explains. "There are 12 different shapes which you put together in different ways. Those shapes are very amazing. The standard puzzle is to put them all back into the box, which is quite a challenge because it is very geometrical. Straight away I decided to make a twoplayer game using the same shapes and rules. Five squares was too much because people can't

remember 12 shapes, so I simplified it down to four. There are seven of them, and seven is very good number to remember. At this moment *Tetris* was ready. The rest was technical stuff."

Pajitnov couldn't write graphics for his alpha-numeric screen so he had to construct the first ever *Tetris* blocks from open and closed bracket symbols. The prototype was completed after just two weeks, but things soon began to slow down. "My programming stopped because I couldn't stop playing," admits Pajitnov. "I needed to improve the scoring, speed and difficulty, but I was very slow with this. I just kept playing and playing, and pretending that I was designing the game."

The coder already realised he had created something special, but he wanted to see the effect it had on his work colleagues. He loaded the game on their computers and left the room. When he returned everyone was hunched over their machines transfixed by the falling blocks. The *Tetris* phenomenon had begun, and Pajitnov began converting the formula to the only IBM PC in the building.

The process was arduous. Unfamiliar with MS DOS and lacking any support documentation, Pajitnov found the going tough. Salvation came in the form of a reclusive high-school student. "The conversion to PC took half a year because I wasn't familiar with it," says Pajitnov. "A schoolboy called Vadim Gerasimov helped me. He was 16 and a kind of genius. He knew DOS and really understood all the specifics of the machine. There were several realtime problems. When you have the pieces falling down the screen they need to fall down at the same speed on whichever computer you use – small processor, quick processor, one monitor, another monitor. That's why you need to use the timer. The timer on the very early PC was very weak. We needed to reprogram the timer and to write lots of assembly routines to make sure everything was standard, no matter what equipment it was on. It was very difficult."

> "My programming stopped. I needed to improve the scoring, speed and difficulty, but I was very slow with this. I just kept playing and playing, and pretending that I was designing the game"

During that period copyright was the last thing on Pajitnov's mind. He was happy to see his game distributed among the computer centres of Moscow. In 1985 the *Tetris* bug had truly bitten, and Moscow businesses complained of low productivity due to the phenomenon. It became so bad in some companies that an anti-*Tetris* computer program was created. The special code hid in computer memory space waiting to delete the game as soon as it became resident on machines. "Some people were so addicted to *Tetris* that they didn't let other people work on their computer," recalls Pajitnov. "I never thought that *Tetris* would become so big, but later on in the computer centre I didn't see anybody who wasn't addicted."

Though the game exuded simplicity, the scramble for the rights to publish *Tetris* were among the most hard-fought and convoluted in videogame history. In the spirit of Russian law Pajitnov's work belonged to the State, but the Soviets were unfamiliar with software licensing. By 1996 *Tetris* had filtered into Hungary, where it was seen by Robert Stein, a London-based software agent. Stein was no gameplayer, but he instantly realised the puzzle game's potential, and decided to export it to the west. Over the next two years Stein attempted to gain the rights to *Tetris* by sending telex messages to the Moscow Academy of Sciences. Stein received many tacit agreements to his ownership but there was never any officially binding contract. Believing he had the rights, Stein sold them on to Spectrum Holobyte and Mirrorsoft. Thus began a chain of events which would see the rights and licences passing from company to company with little legitimacy.

As the legal wrangling over rights and licences continued, Pajitnov quietly got on with his work at the Academy. "I was in Russia and I didn't see any success," he recalls. "I saw several magazines

with *Tetris* advertisements, but I had no time to enjoy the glory. I gave my work and granted the rights to be published. I kept my mouth shut for ten years." Pajitnov knew little of the international tension his simple puzzle game was causing.

In 1988, just after Arakawa had seen *Tetris* for the first time, the race for the all-important handheld rights began. Nintendo asked Henk Rogers – the man who had gained the Japanese computer rights from Spectrum Holobyte – to hammer out a deal with the Russians. Meanwhile, Stein was entering his own negotiations, and Robert Maxwell sent his son, Kevin, to close a deal for Mirrorsoft. Unknown to each other they were all to be brokering deals with the Russians on the very same day, in the same building, but in separate rooms. Eventually, Rogers secured the 'legitimate' home game and handheld rights; Stein returned with the coin-op rights; while Kevin Maxwell came away with nothing but empty assurances. It was a situation which was to see Robert Maxwell – furious at his company's loss of the rights – holding crisis meetings with Mikhail Gorbachev. But the Russians would not budge; Nintendo had its killer app for the Game Boy.

Production began immediately, and Arakawa's expectations were confirmed. The universal game had found its perfect home. Parents, teachers, and executives – as well as the more typical gamers – were drawn to the falling block phenomenon, and the Game Boy's success was assured. "I was very lucky because of the Game Boy," remarks Pajitnov. "Game Boy was invented for *Tetris*, and *Tetris* was written for Game Boy, let's put it that way. They were so well matched for each other. It was a very good version, very well done."

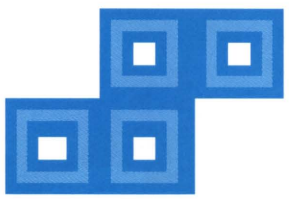
Tetris has certainly generated some disturbing and surprising effects. Some players complain of becoming 'Tetrisised' – a form of insomnia induced by the relentless appearance of falling blocks in the mind. Other research has maintained that playing *Tetris* can improve IQ scores. But it is the game's ability to cross age and gender barriers which remains its most profound quality. "I've played this game for more than 16 years," adds Pajitnov. "I like that you order the world. You have chaos in your play field with this random sequence of pieces, and what you do is you put everything into order. When you clean the field you have a really good feeling. I would say this is very female. I think a lot of women are fascinated with the same kind of concept, because it's putting things into order. That's why the game is very popular among females."

Pajitnov moved to the US after Henk Rogers – who had become a good friend – persuaded him to stay after a visit. "The first time I got excited by *Tetris* was when I first came to the Computer Electronic Show in 1990," he recalls. "Then I was treated like a king. People were fascinated to meet me – a strange person from a strange country. Russia was very popular at that time because of Perestroika, and I eventually moved to the States in 1991."

But why is *Tetris* so addictive? Pajitnov seems as baffled as anyone else as to its secret. "People are fascinated by successful products and try to analyse it and how it works. But no one really discovered the real secret of the game – which nobody knows. There is no universal law which makes *Tetris* very successful. There are just several factors which work well in combination. I do remember one guy in Japan who asked for my autograph on the *Tetris* cartridge for the Game Boy. When I signed it he took some super glue and glued it into the Game Boy. He said: 'This Game Boy is dedicated to *Tetris* only'. These things I can't explain."

Pajitnov is now receiving royalties for the game, which has successfully crossed all boundaries of taste and culture. Now working for Microsoft on other puzzle titles, he is still searching for a game to rival his most famous creation – although there must be some obsessive types out there who hope he never succeeds.

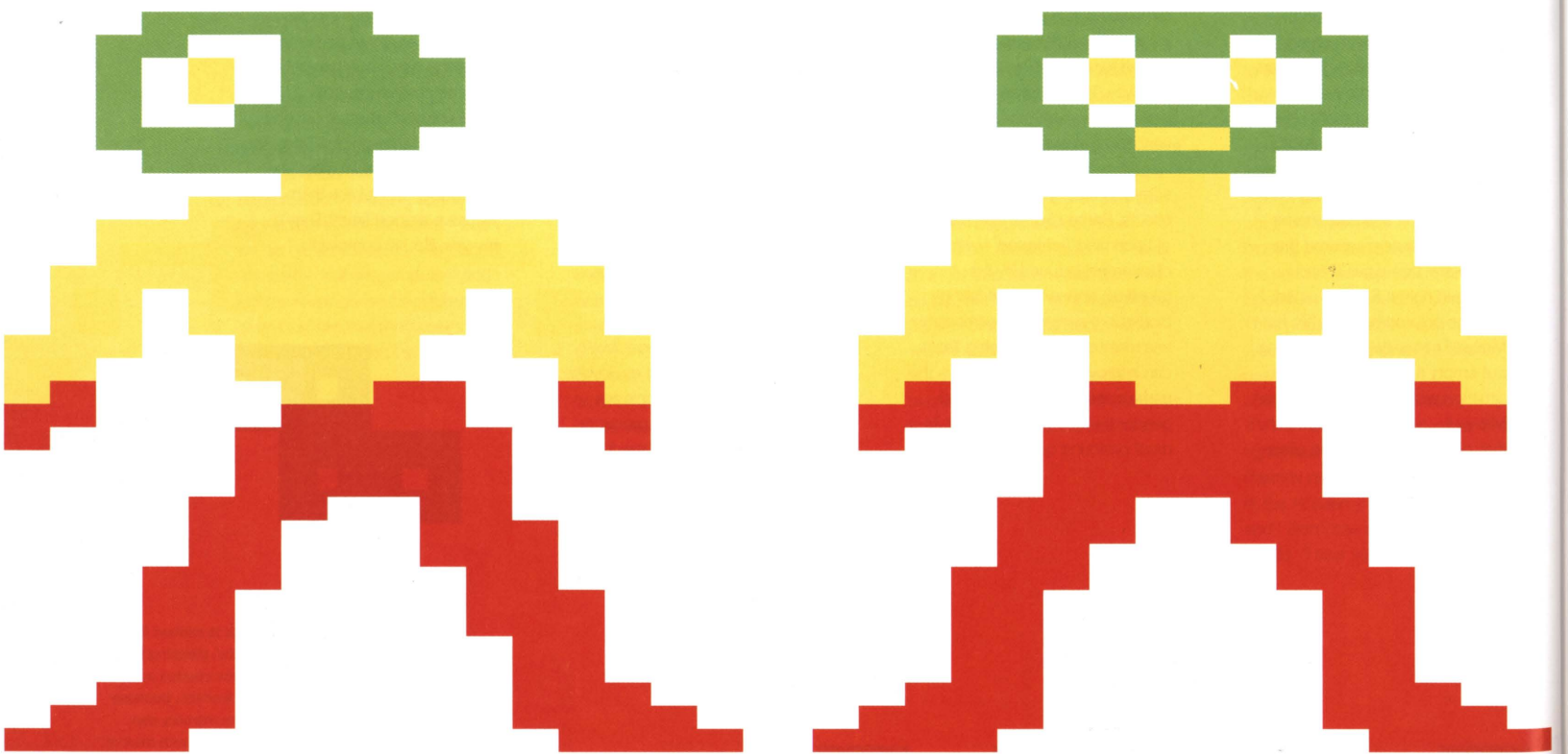
"Everyone talked about how many hours they played *Tetris* and how many careers I ruined," he concludes. "But if I ask them, did you have a good time? They'd say yes. So, no complaints."



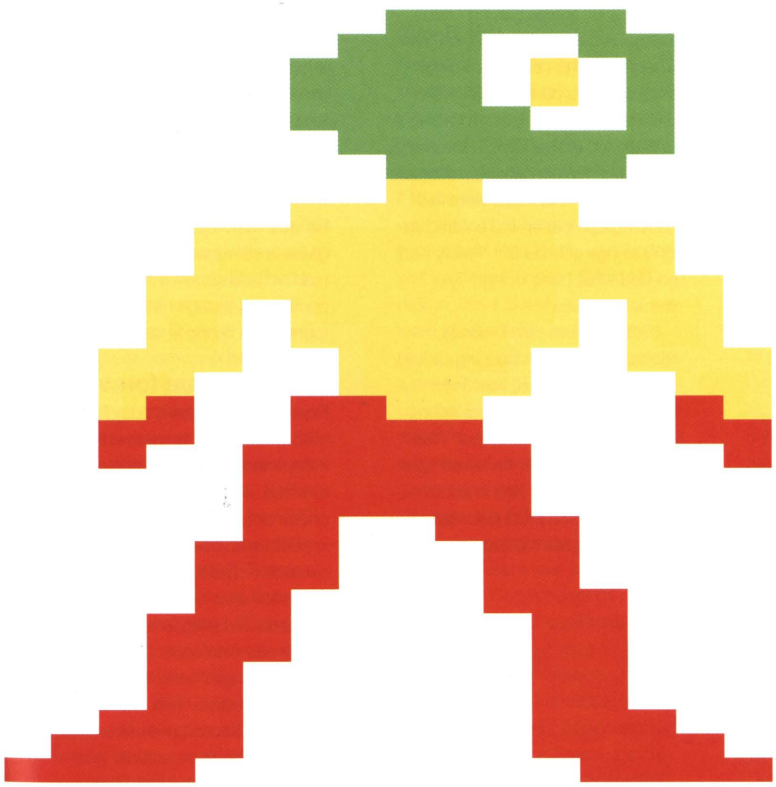
The title *Tetris* is derived from the word 'tetra', meaning four in Greek. Pajitnov created seven shapes, or tetramino, because the short-term memory can handle seven units with relative ease. The shapes are now a part of gaming legend

Repton

Many developers have attempted to create a reptilian videogame icon, but none ever proved as recognisable as *Repton*'s eponymous hero. It had intricate level design and impeccable coding but an inhumane industry saw its young creator move on to pastures new



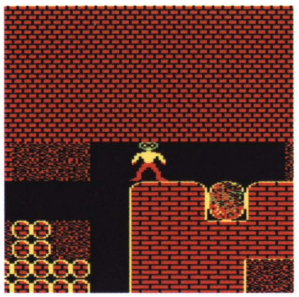
Original format: **BBC Micro**
Publisher: **Superior Software**
Developer: **Tim Tyler**
Origin: **UK**
Release date: **1985**

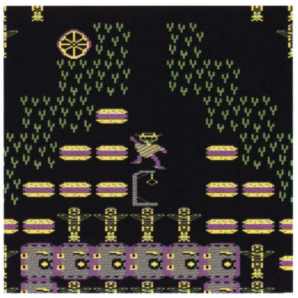


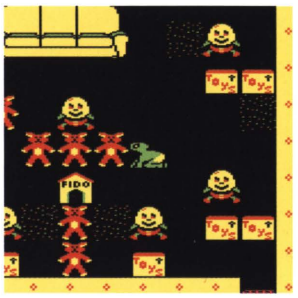
The summer of 1985 saw a game slip onto the market which was to become the start of a best-selling franchise and, after *Elite*, probably the best-known game ever to be released for the BBC family of home computers. Its 15-year-old creator earned telephone-number royalties from its publication, and that of its sequel. The game: *Repton*, the author: a now reflective **Tim Tyler**. Yet two years afterwards, before he'd even finished his A-levels, Tyler had sold the franchise to the name of his successful lizard and confessed that he was through with programming, calling it "too inhumane to make a career of."

Repton the lizard is an instantly recognisable icon to any BBC or Electron owner, mainly because in sprite form he was enormous. His job

Repton made its creator one of the richest 15-year-olds in the country, and the franchise became Superior's best-selling range







was to push boulders over ledges, escape from (or squash) bug-eyed monsters and pick up diamonds to escape from each level. Rocks, diamonds and monsters conspired to make the original game's 12 levels the most interesting and colourful challenge to hit the BBC's screen to date, and its ragtime music became the soundtrack to many childhoods: around 125,000 over its five-year peak. It was the player's intelligence and reflexes versus the level designer's cunning. 'Can you finish *Repton*?' challenged the adverts.

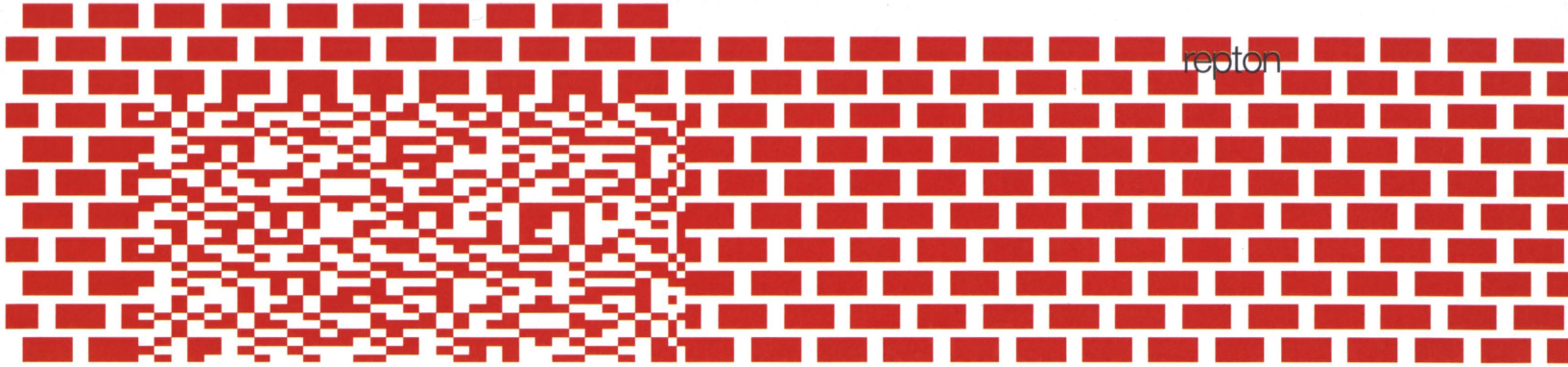
Was it just a *Boulderdash* rip-off? It seems unfair given that Tyler (still) has never played *Boulderdash*. But he acknowledges that while having a similar idea in his head, he'd read a review of *Boulderdash* and declared it his inspiration. His confidence to program *Repton* was gained years earlier after reading an article in 'Which?' magazine: "I felt I'd read all I needed to know from that one article; I even started writing programs before I'd bought a computer to try them on." Did he spend his time playing games? "Oh yes, that was its major purpose. I spent a lot of time playing *Frak*, *Zalaga*, *Arcadians*, *Defender*..." With a hectic playing schedule, it's not surprising that he wrote *Repton* in one busy month before submitting it to Superior. He had little in the way of tools: a homebrew pixel editor for the graphics, and maps were laid out on graph paper and entered as long strings of base 32. "I really had no idea what I was doing," Tyler states modestly.

After its successful release, **Richard Hanson**, managing director of Superior Software, was soon taking calls from customers asking when a sequel would be out. After three months of this, he asked Tyler the same question, and in another month, Tyler had produced *Repton 2*, which was like the first one, only very much harder. Rather than have a number of discrete similarly sized levels, *Repton 2* consisted of one giant level, with different areas linked by transporters and new features such as lethal spirits which could be shepherded into cages to unlock more diamonds. It is notable that the idea to include a password and map facility in the original *Repton* was down to Chris Payne, Superior's then marketing manager; Tyler got his way with *Repton 2*, and the game is still regarded as the thinking man's challenge within the emulation community, though many people found it too taxing at the time.

Diamonds are forever

Repton 2 kept players busy for six solid weeks after its release. Hanson knew it was six weeks because after this time, Superior began to receive phone calls to the effect that it was impossible to complete. The game refused to display the finishing sequence after dedicated players had collected every one of the 1,500-odd diamonds. Due to a last-minute change ("never a good idea," Hanson stresses), Tyler had caused the game to count one more diamond than there actually was, and there was a smattering of disappointment among the people who'd discovered this. However, a fixed version was issued, and it can't have made that much of a difference because *Repton 2* remains Superior Software's best-selling title to date.

Inevitably another sequel was planned, but Tyler's interest had waned. Although denying he had achieved any celebrity status, he admits that people stopped him in the street following *Repton*'s release. ("I've no idea how they recognised me"). The money had made a big difference to the confidence of this 17-year-old, but no years of rock 'n' roll excess followed. He went to study maths, sold his franchise and



"tried to avoid the programming at college as much as possible."

Matthew Atkinson was picked by Superior to program the third *Repton* title in February 1986. Some design tweaks were made by Hanson and Payne – so that Repton was required to find a time bomb before being allowed to finish a level, for instance. The level and password structure from the original game was brought back, and the spirits were brought over from *Repton 2*. Its major innovation, not just for *Repton* games but for gaming in general, was an integrated level and graphics editor. Did Hanson know it would be a success? "It's rare to be able to say in advance for sure, but with *Repton 3* I was 99.9 per cent, well, no, 100 per cent confident that it would be a major success."

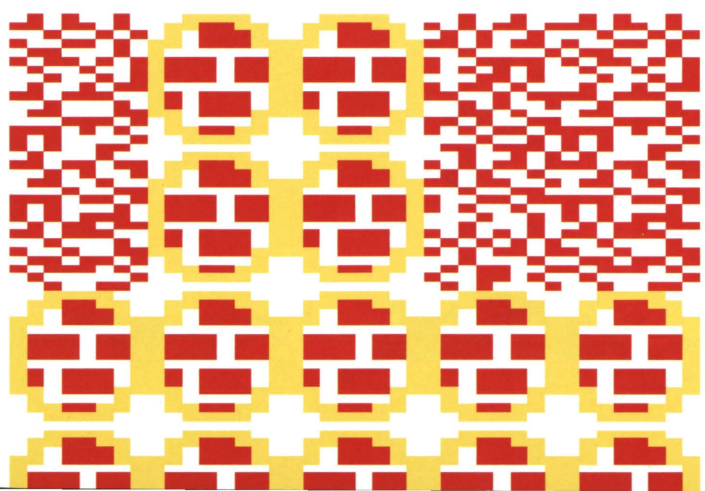
Tyler remembers being critical of the game in general – particularly the jerky scrolling: "but that shows what I know, I suppose." *Repton 3* was the best-selling game for the BBC from its launch in November 1986 until mid-February 1987. Then in-house, using the same tools they shipped with the game, Superior produced *Around The World in 40 Screens*, *The Life of Repton* and *Repton Thru Time* over the next 18 months, all selling spectacularly and running on the same code as the original. Certainly these were the first true game 'expansion packs', and more successful than the jaded mission discs that follow any moderately successful PC game. Hanson, a man with a canny commercial mind, was pensive when asked why they didn't just produce another couple, given their high returns. "I suppose I didn't want to be seen to be milking it."

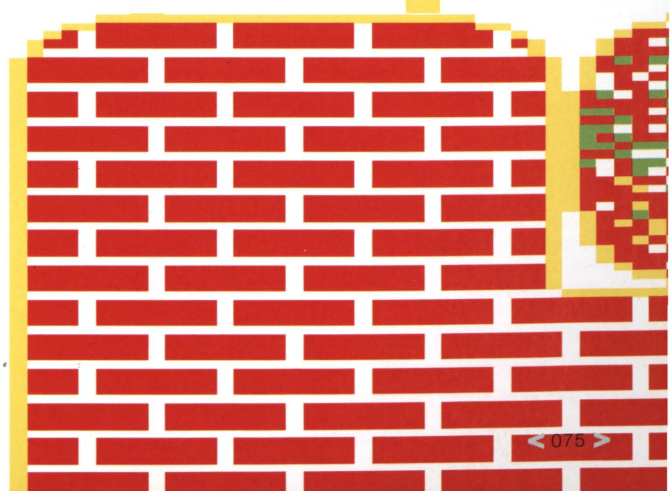
Great job

Did Atkinson know what an important game *Repton 3* was going to turn out to be? "No, it was just a great job. The call came out of the blue, they sat me down and offered it to me over lunch. They told me I wasn't the best programmer on their books, but I lived locally and worked well in a team." Indeed *Repton 3*'s design was a closely monitored team effort, a rarity for 8bit games, and it took eight months to create as a result. Much of this time was spent backtracking on the decision to make the game and editor the same program, an ambitious 'WYSIWYG' game editor that never came about. However, the BBC Master's arrival in 1987 allowed this integration to be reinstated, and it was kept this way for the later Commodore 64 port.

More than just a commercial decision, putting a halt to further themed *Repton 3* releases was proof that Superior's catalogue had blossomed through the acceptance and variation of the *Repton* formula. When *Ravenskull* (another scrolling 2D puzzler) was submitted, Hanson was confident of its success. Also *Pipeline*, *Bone Cruncher* and *Clogger* were notable traders on the *Repton* formula, not to mention the swathes of similar type-in games that graced the pages of magazines at the time. This trend culminated (on the BBC at least) with Superior releasing *Repton Infinity*. A '*Repton* construction kit', the level and sprite editors were augmented with a compiled programming language which players could use to make their own *Repton*-type games. The game shipped with several surreal variants on the *Repton* formula, including one starring a bulldozer, and spawned a popular competition in 'The Micro User'.

Even now, the lizard is not dead, just resting. Tyler discovered Java ("Not perfect, but I never want to go back to machine code… even C++ is too low-level") and made *Rockz*, an unfinished game in the style of *Repton 2*. Atkinson ("I miss machine code; people come out of college without a clue how to squeeze the last drop of speed from a machine") was just "amazed so many people are still interested after all this time." Hanson is quietly happy at *Repton*'s continuing success, and plans to release versions of the old games for the PC, mobile phone and Game Boy Advance platforms under the banner of Superior Software. "The Game Boy Advance is the first platform in ages that's really made me sit up and take note… genuinely exciting."





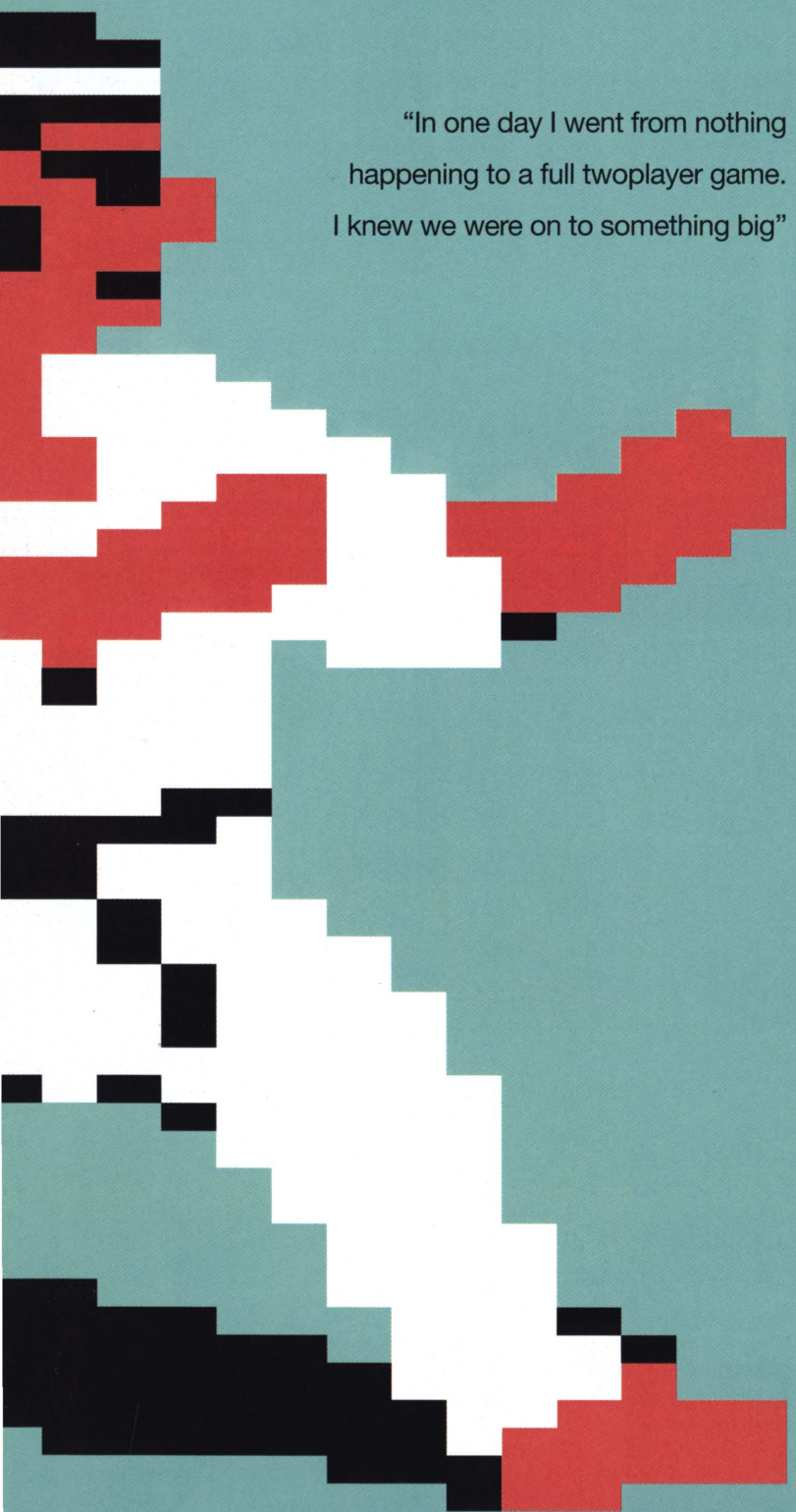
The Way Of The Exploding Fist

Edge learns just how differently they do things in Australia, as Gregg Barnett of Beam Software relates the sun, sea, and sex-stuffed story that lies behind the genesis of a seminal martial arts videogame

Original format: **Commodore 64**
Publisher: **Melbourne House**
Developer: **In-house (Beam Software)**
Origin: **Australia**
Original release date: **1985**

The Way Of The Exploding Fist embodied everything that is sacred to the martial arts fraternity – elegance, control, precision. It eschewed the scrolling scenery and endless procession of enemies more typical of early fighting games such as *Kung Fu Master* and attempted something radical: a one-on-one contest boasting an audacious array of fighting moves. Though *Karate Champ* was to appear during the game's development, *Exploding Fist*'s concentration on simulation and a dynamic block/counter attack mechanic set it apart from anything else which had gone before.

The title came from fledgling Australian developer Beam Software and was tailored for the UK market by its publishing wing, Melbourne House. The locale which provided the resources to make the title was a far cry from the tranquil backdrops which were to typify the game's eastern flavour. As the game's creator, **Gregg Barnett**, explains: "South Melbourne was not only the computer centre of Melbourne, if not Australia, but it was the red-light area with scores of brothels… so, literally, we had a brothel on one side, one on the other, and then one across the street. I don't know if any of our guys used them, but they knew all the girls quite well because they'd share tram rides and they'd be stood outside showing clients in. Mind you, another



"In one day I went from nothing happening to a full twoplayer game. I knew we were on to something big"

distraction was the topless beach."

Diversions aside, Barnett was intent on making *Exploding Fist* an incredibly realistic interpretation of a martial arts discipline. The 18 moves of the game provided the focus for the initial outline. "As with a lot of my designs it started with the user interface," begins Barnett. "For *Exploding Fist* I spent a lot of time with an old joystick, mapping imaginary moves on to it. It had to be intuitive so a manual wasn't a requirement. We had pull down for duck and punch low, push up for jump, pull back to retreat (or block if being attacked). It was this procedure that determined which moves were in and which weren't. Then research was done on the moves – films and martial arts books – to give us a consistent style for the artist to work with."

Bruce Lee's popularity and distinctive fighting style supplied much of the inspiration. Barnett sought out every book in the district to provide a focus for his vision. But, interestingly, the game's focus on power and aggression was tempered with a feminine touch. "*Exploding Fist* combined Bruce Lee's Wing Chun style which was actually started as a female style of martial arts," explains Barnett. "Originally it was developed so that nuns could protect themselves with lots of little hand movements to protect their breasts. But then when he went to Hollywood he exaggerated and he used The Exploding Fist – a style in which the fighter would keep his body loose and then like a Japanese karate fighter he'd tense it at the last second."

Lee's infamous one-inch punch encapsulated the spirit of the game. Bouts between two masters would often follow a pattern of waiting and blocking until openings formed. A quick strike with the all-powerful roundhouse kick could win the match if timed to perfection. "It worked graphically as well," adds Barnett. "Because you could have a great impact where you had everything loose, and then you'd swing everything out and at the last second the artist would tighten the fist and that would be the impact point. With the collision detection that I opted to use, the hit was always accurate."

Barnett's perfectionism went to extraordinary lengths. With research already well underway he began to develop the game – by writing all the code down, line by line, in longhand. This process took approximately two months. "Then I started with a tree diagram linking all the subroutines, not just main modules," he explains. "I would then create pseudo code (half English, half Pascal), before coding all the routines in assembler. In fact, the first compile wasn't even attempted until I had everything for the twoplayer game ready. In one day I went from nothing happening to a full twoplayer game (much to the relief of one or two people). That very day I remember returning to my desk from a coffee break to find a queue of people playing *Exploding Fist*, at which point I knew we were on to something big."

Taking the handwritten data and then transferring it into living, breathing code was not only a tedious process but relied heavily upon the reliability of existing technology. "In terms of coding, in those days I engineered every facet of the development cycle,' adds Barnett. 'The main reason for this was the old assemblers we had to use. They would take hours for full compiles, so you had to get them right. A classic example was just before *Exploding Fist*, when I was finishing off *Horace Goes Skiing*. It was the last race for the America's Cup, the year Australia first won it from them. I was intending to work all night, but started a full compile anyway. I went home and watched the race (over four hours), came back and the compile was only halfway through."

Pixel perfection

The game's most exquisite feature was its pixel-perfect collision detection. Barnett created his own editor to achieve the accuracy he desired. This plotted every impact animation frame for frame, rather than the standard collision-box approach. The collision routines coupled with the sound effects resulted in an incredibly satisfying reward when blows

landed. The addition of more pronounced crunch effects for perfectly timed hits made the game particularly tactile, and remained the benchmark for fighting games for many years.

The sprite animation and sound effects are also fondly remembered 16 years on. For Barnett these are the two technical aspects of which he is particularly proud: "The more innovative things were the sprite meshes (Commodore 64) and the digitised screams and shouts. Both of these I actually delegated internally. We went on to far bigger and better things with Commodore 64 sprites, but at the time *Exploding Fist* was the best utilisation of them. As for the sampled sound, it was a huge part of the game's success. The pre-attack wind-up screams and the bone-crunching impacts were something new in those days. Even the scream during loading is still remembered today. The number of people who have mentioned how they jumped the first time they heard that is quite amazing."

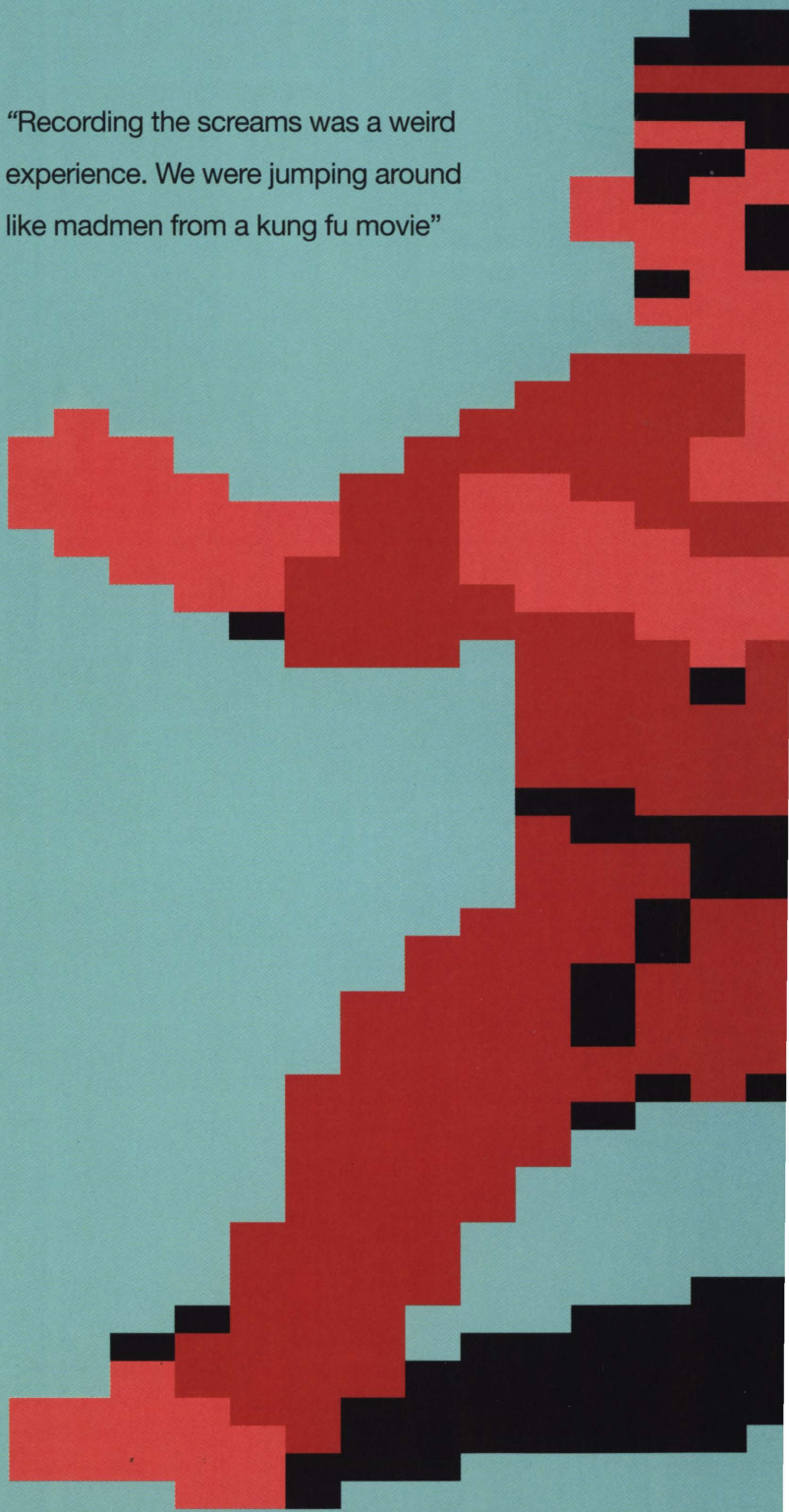
With the twoplayer mode already in place, Barnett began implementing the AI to ensure that a solid oneplayer experience flourished: "I remember spending two weeks or so analysing how people played the game. From that information I created a list of AI variables: aggression, defensiveness, speed, ability to block or counter attack, favourite moves, sequences, and learning. I quickly created a perfect opponent with high marks in all these attributes. I then deteriorated the attributes to give me the lesser opponents. In other words I started with the best opponent and just worked backwards from there."

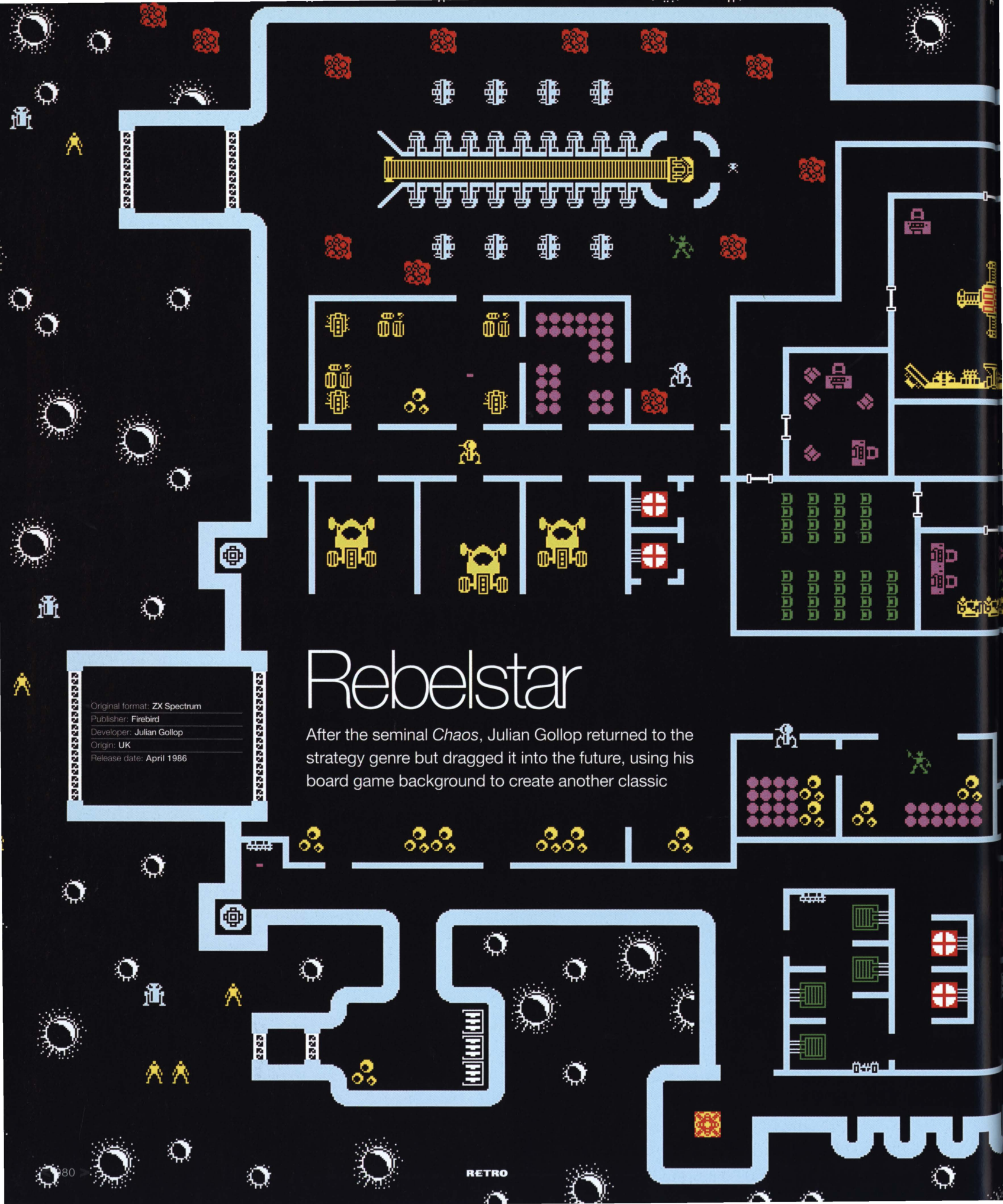
The formula worked tremendously well – with one slight oversight. "I always regretted the leg sweep," laments Barnett. "Because I made this simulation and I made it very accurate and, of course, in real life the leg sweep is very powerful at knocking your opponent down. It doesn't do much damage other than that. Initially I had a layer of moves where once you were collapsed on the ground you could still keep fighting – they never made it through. But the leg sweep was still in there. It was such a wide move with the legs going out three or four feet. So there's all that distance and unless your opponent jumps you're going to hit them. I kept it accurate, which was a mistake."

Unfortunately, *The Way Of The Exploding Fist* devotees soon discovered the crippling power of the leg sweep and news that the game could almost be completed with just one technique was reported in the gaming press. While this never detracted from the twoplayer experience, Barnett certainly bemoans the fact that some people preferred to take the easy route through the oneplayer mode. "They could get good at the leg sweep for the first seven or eight opponents if they were that sort of boring person – just pressing and pressing and pressing. In the Spectrum version we fixed that problem, but on the Commodore version if people wanted to be really anal about it they could leg sweep their way through. Although when they got to the last couple of opponents they then find that they have real trouble because the last two would just jump the attack."

Though the title is often remembered for its cathartic pleasures, for developer Beam Software the game's inherent exuberance threatened to bring out the child to an alarming degree. Mix a hi-octane Jackie Chan movie with a scene from 'A Shot In The Dark', and an approximation of the office atmosphere during voice sampling might be conjured up. Inspector Clouseau stalking a recalcitrant Kato couldn't have caused more of a disturbance among the whorehouses of South Melbourne. "Recording those screams was a decidedly weird experience," concludes Barnett. "We were jumping around like madmen from a kung fu movie and screaming our lungs out, even getting the odd complaint from neighbours. Ironically, 'The Times' did an article on *Exploding Fist*, saying how games were growing up and mature names like *The Way Of The Exploding Fist* proved it. Which is not exactly what I had in mind at the time..."

"Recording the screams was a weird experience. We were jumping around like madmen from a kung fu movie"

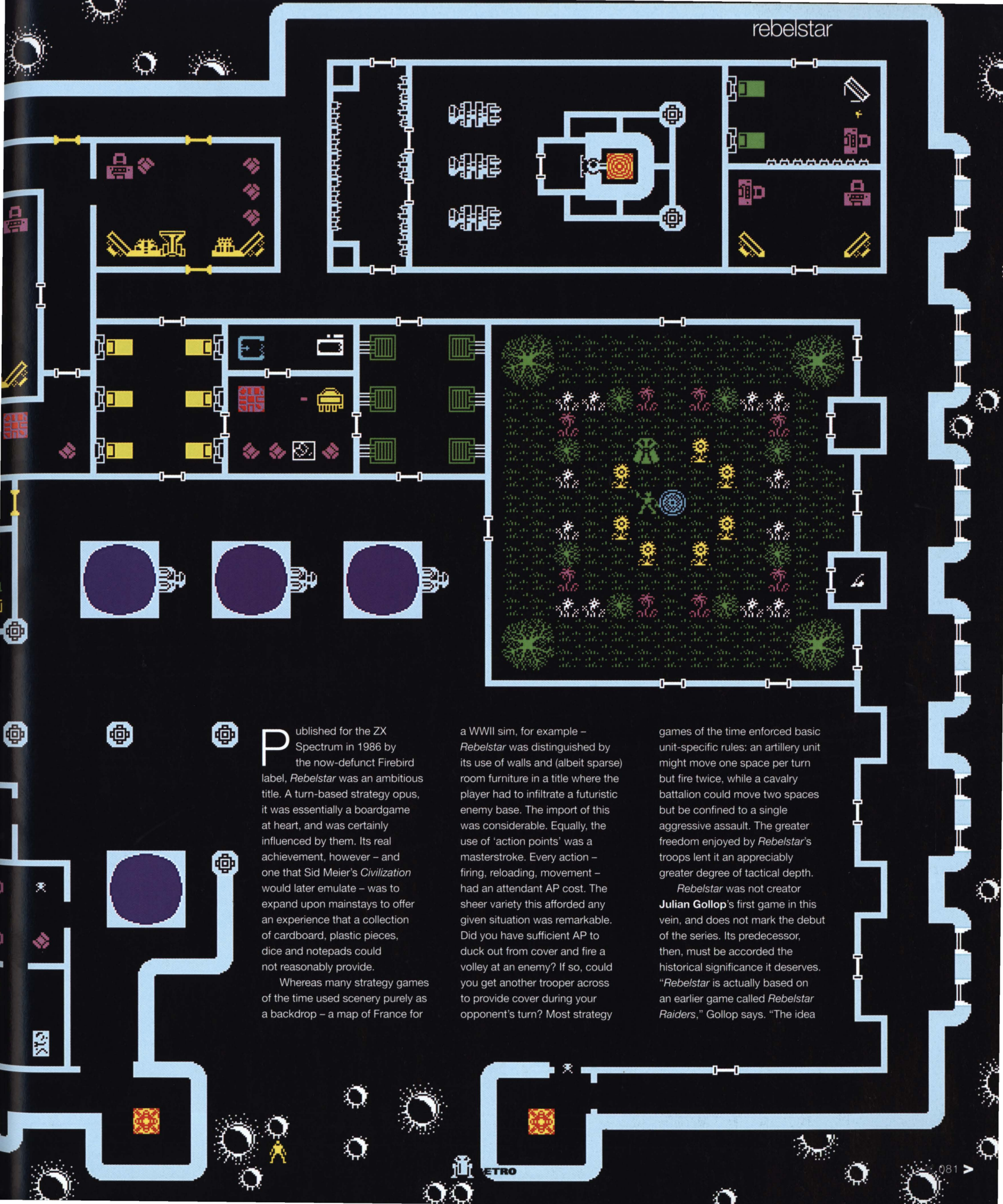




Rebelstar

Original format: ZX Spectrum
Publisher: Firebird
Developer: Julian Gollop
Origin: UK
Release date: April 1986

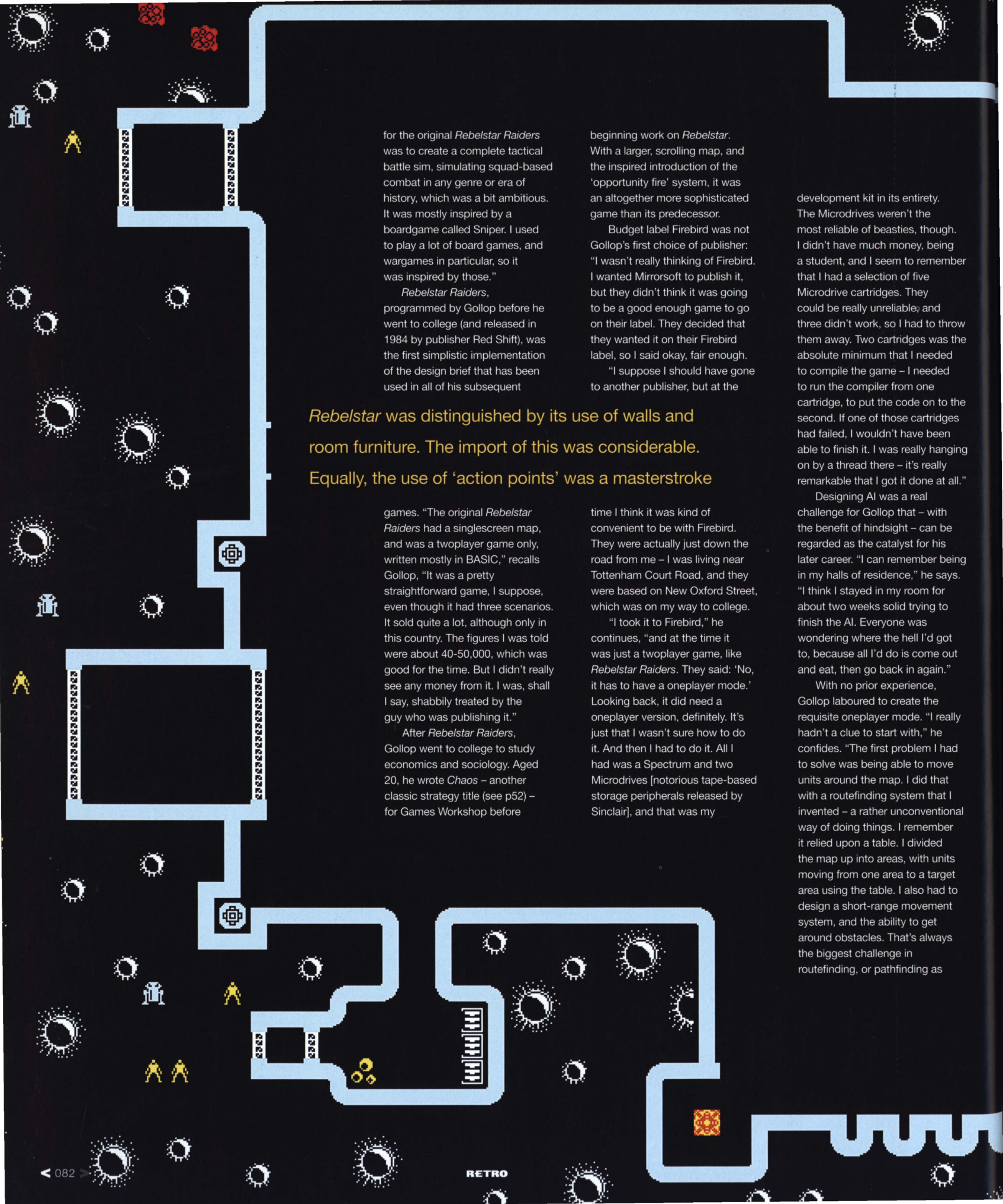
After the seminal *Chaos*, Julian Gollop returned to the strategy genre but dragged it into the future, using his board game background to create another classic



Published for the ZX Spectrum in 1986 by the now-defunct Firebird label, *Rebelstar* was an ambitious title. A turn-based strategy opus, it was essentially a boardgame at heart, and was certainly influenced by them. Its real achievement, however – and one that Sid Meier's *Civilization* would later emulate – was to expand upon mainstays to offer an experience that a collection of cardboard, plastic pieces, dice and notepads could not reasonably provide.

Whereas many strategy games of the time used scenery purely as a backdrop – a map of France for a WWII sim, for example – *Rebelstar* was distinguished by its use of walls and (albeit sparse) room furniture in a title where the player had to infiltrate a futuristic enemy base. The import of this was considerable. Equally, the use of 'action points' was a masterstroke. Every action – firing, reloading, movement – had an attendant AP cost. The sheer variety this afforded any given situation was remarkable. Did you have sufficient AP to duck out from cover and fire a volley at an enemy? If so, could you get another trooper across to provide cover during your opponent's turn? Most strategy games of the time enforced basic unit-specific rules: an artillery unit might move one space per turn but fire twice, while a cavalry battalion could move two spaces but be confined to a single aggressive assault. The greater freedom enjoyed by *Rebelstar*'s troops lent it an appreciably greater degree of tactical depth.

Rebelstar was not creator **Julian Gollop**'s first game in this vein, and does not mark the debut of the series. Its predecessor, then, must be accorded the historical significance it deserves. "*Rebelstar* is actually based on an earlier game called *Rebelstar Raiders*," Gollop says. "The idea



for the original *Rebelstar Raiders* was to create a complete tactical battle sim, simulating squad-based combat in any genre or era of history, which was a bit ambitious. It was mostly inspired by a boardgame called Sniper. I used to play a lot of board games, and wargames in particular, so it was inspired by those."

Rebelstar Raiders, programmed by Gollop before he went to college (and released in 1984 by publisher Red Shift), was the first simplistic implementation of the design brief that has been used in all of his subsequent games. "The original *Rebelstar Raiders* had a singlescreen map, and was a twoplayer game only, written mostly in BASIC," recalls Gollop, "It was a pretty straightforward game, I suppose, even though it had three scenarios. It sold quite a lot, although only in this country. The figures I was told were about 40-50,000, which was good for the time. But I didn't really see any money from it. I was, shall I say, shabbily treated by the guy who was publishing it."

After *Rebelstar Raiders*, Gollop went to college to study economics and sociology. Aged 20, he wrote *Chaos* – another classic strategy title (see p52) – for Games Workshop before beginning work on *Rebelstar*. With a larger, scrolling map, and the inspired introduction of the 'opportunity fire' system, it was an altogether more sophisticated game than its predecessor.

Budget label Firebird was not Gollop's first choice of publisher: "I wasn't really thinking of Firebird. I wanted Mirrorsoft to publish it, but they didn't think it was going to be a good enough game to go on their label. They decided that they wanted it on their Firebird label, so I said okay, fair enough.

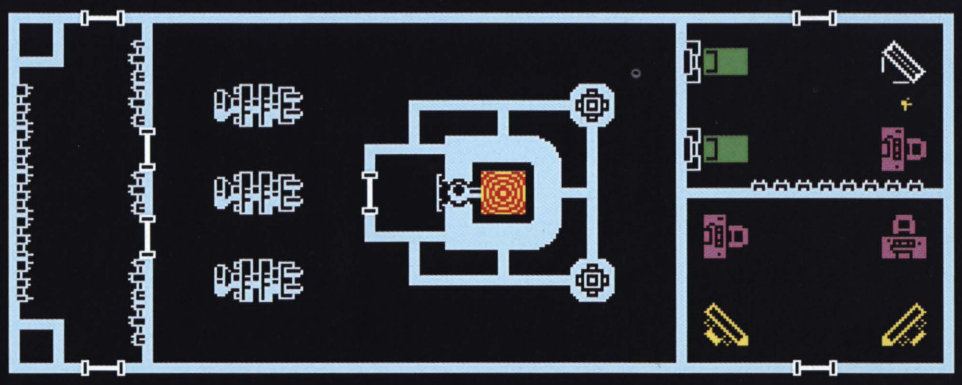
"I suppose I should have gone to another publisher, but at the time I think it was kind of convenient to be with Firebird. They were actually just down the road from me – I was living near Tottenham Court Road, and they were based on New Oxford Street, which was on my way to college.

"I took it to Firebird," he continues, "and at the time it was just a twoplayer game, like *Rebelstar Raiders*. They said: 'No, it has to have a oneplayer mode.' Looking back, it did need a oneplayer version, definitely. It's just that I wasn't sure how to do it. And then I had to do it. All I had was a Spectrum and two Microdrives [notorious tape-based storage peripherals released by Sinclair], and that was my development kit in its entirety. The Microdrives weren't the most reliable of beasties, though. I didn't have much money, being a student, and I seem to remember that I had a selection of five Microdrive cartridges. They could be really unreliable, and three didn't work, so I had to throw them away. Two cartridges was the absolute minimum that I needed to compile the game – I needed to run the compiler from one cartridge, to put the code on to the second. If one of those cartridges had failed, I wouldn't have been able to finish it. I was really hanging on by a thread there – it's really remarkable that I got it done at all."

Rebelstar was distinguished by its use of walls and room furniture. The import of this was considerable. Equally, the use of 'action points' was a masterstroke

Designing AI was a real challenge for Gollop that – with the benefit of hindsight – can be regarded as the catalyst for his later career. "I can remember being in my halls of residence," he says. "I think I stayed in my room for about two weeks solid trying to finish the AI. Everyone was wondering where the hell I'd got to, because all I'd do is come out and eat, then go back in again."

With no prior experience, Gollop laboured to create the requisite oneplayer mode. "I really hadn't a clue to start with," he confides. "The first problem I had to solve was being able to move units around the map. I did that with a routefinding system that I invented – a rather unconventional way of doing things. I remember it relied upon a table. I divided the map up into areas, with units moving from one area to a target area using the table. I also had to design a short-range movement system, and the ability to get around obstacles. That's always the biggest challenge in routefinding, or pathfinding as



it's now called. I had to add various heuristics into the movement, so that certain targets were assigned. It was quite simple: each unit was given a target, based on how close it was, how near it was to the command centre, and a few other considerations."

While Gollop's efforts in creating a oneplayer mode were vital in getting *Rebelstar* published (and, of course, bought and played), it was the introduction of the 'opportunity fire' system that made it truly outstanding. It was a concept that integrated seamlessly with the action points device. If a soldier was left with sufficient AP, he would be able to fire if an enemy unit moved into view. The strategic implications of this were manifold, but, as Gollop candidly admits, it wasn't actually his idea: "It's actually taken from the board games I used to play. Although it's not quite implemented in the same way as *Rebelstar* or later games, the concept is one that has been used in a number of board games.

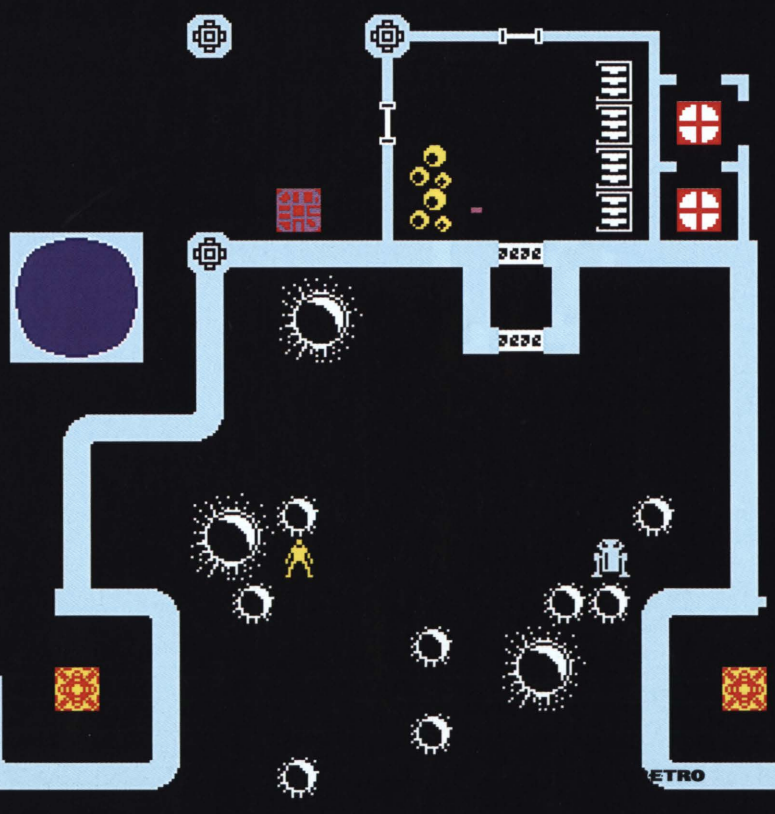
"With Sniper, for example, each player has a little pad where they write down the moves of their soldiers, and plot firing. They can specify a line of fire that, should an enemy unit cross it, their unit will shoot. That's where it comes from. I can't claim it's an original idea."

Gollop's interpretation of the concept, however, was an extremely effective (indeed, vital) aspect of *Rebelstar*. "It had to be included," he stresses. "One of the main anomalies with turn-based games is that you can be covering the end of a corridor and an enemy unit will just move past it during their move. You don't get the chance to shoot it. That doesn't feel right, and it's certainly not realistic – it doesn't make for very good gameplay. But with opportunity fire implemented, it makes things far more interesting. Your tactics become very positional as you cover corridors and such areas, and you have to use cover appropriately. You can shoot down a corridor at a passing enemy, or use opportunity fire to cover a door in anticipation of an enemy unit coming through it. It just makes it more exciting."

Released on a budget label, *Rebelstar* made Gollop a better return than its predecessor: "It seemed to do quite well, because I remember getting quite a bit, even though I was only getting 10p per copy, which is peanuts – or a fraction of a peanut, to be honest. I can't remember how many units it shifted, though."

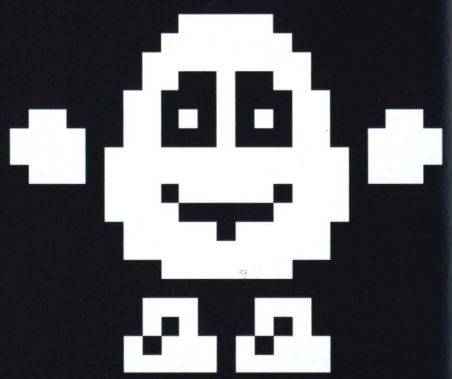
After leaving college and 'bumming around' for a while, Gollop formed Target Games in 1988, with the intention of publishing his own titles. "I made the decision in 1988 that I was going to do games full time, but maybe that was because I couldn't think of anything else," he laughs. Having finishing *Rebelstar 2* in 1988 (again published by Firebird), Gollop created *Laser Squad*, released on the Spectrum on his own label. This was followed by *Lords Of Chaos* – an update of *Chaos* – before Gollop created his most successful game to date: the excellent *UFO: Enemy Unknown* (also called *X-COM*). Two more *X-COM* titles have since been released, along with *Magic And Mayhem*, a fantasy title. (Gollop's most recent project, *Dreamland Chronicles*, is in limbo.) It would be easy to get the impression that Gollop is his own target audience; that, with each game he creates, he's making it because he wants to play it. As with other industry veterans that have spent many years working with a particular genre – id's John Carmack with firstperson shooters, Origin's erstwhile Richard Garriot with RPGs – a few cynics might accuse him of being a one-trick pony. To do so is to miss an important point: it's the sheer strength of that original idea that allows it to be adulterated and enhanced as technology allows, but still entertain as much as it did so many years ago.

So, while *Rebelstar* was released 14 years ago, you could argue Gollop is still working towards realising his vision.

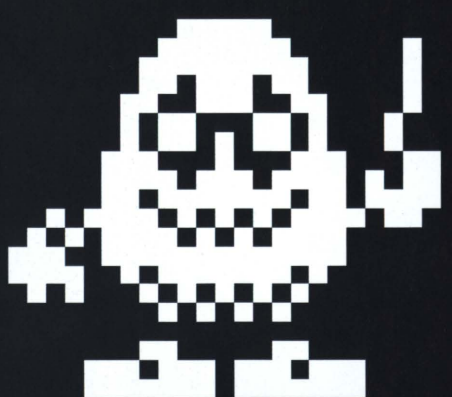


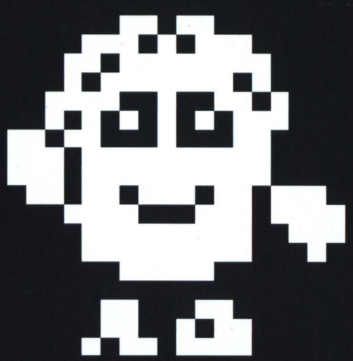
Dizzy

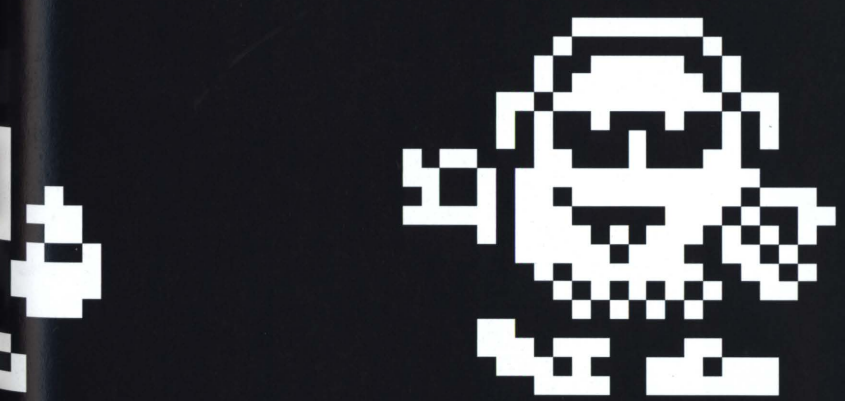
Ignored by the videogame intelligentsia, loved by the masses, *Dizzy* was the blockbusting videogame phenomenon of mid-'80s Britain. And the story of how a smiling egg came to dominate the software charts for three years is one of bedroom coding taken to its absolute limits



Original format: **ZX Spectrum**
Publisher: **Codemasters**
Developer: **Andrew Oliver, Philip Oliver**
Origin: **UK**
Release date: **1986**



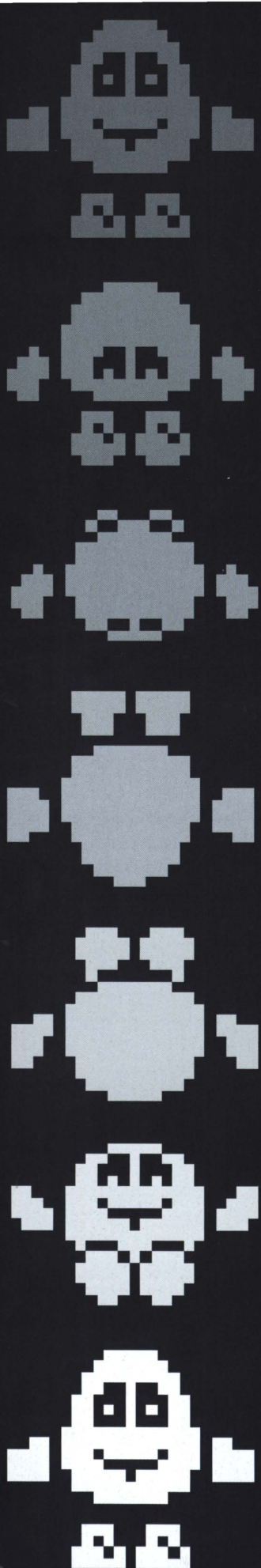




The tale of how the Oliver twins got into the videogame industry is one of those Britsoft yarns, comparable to the one about Gremlin starting up above a computer shop or Peter Molyneux and Les Edgar kick-starting the development of *Populous* after receiving free Amiga hardware that should have gone to Torus, not Taurus. The brothers, recent purchasers of a BBC Micro, entered a competition on a Saturday morning kids show ("Isla St Clair, Tommy Boyd, Jeremy Beadle," remembers **Andrew Oliver**) to design a videogame. They won – being the only ones to send an actual game rather than a design idea drawn in crayon – and later sold *Gambit* to Acornsoft for £200.

Spotting the money-making potential of videogames, Andrew and Philip spent the next year bashing out coin-op clones and educational software for a variety of budget publishers initially on the BBC and later on the Amstrad 6128. Then, in September 1985, the twins attended the first ever ECTS where they met Richard and David Darling. The future Codemasters founders were setting up on their own and needed freelance programmers. "One of their lines was if you write a game for us we'll give you £10,000,' recalls **Philip Oliver**. But there was a catch: it had to be out by Christmas. So the brothers rushed home and wrote flip-screen platformer *Super Robin Hood* in six weeks. It sold 100,000 copies.

It was during work on the brothers' next Codemasters title, *Ghost Hunters*, that Philip started fiddling around with the basic character design that would lead to *Dizzy*. As he explains, "I was sitting there working on the star of *Ghost Hunters*, drawing his face, and I had three pixels high, four pixels wide and four colours. You can't be too creative with that, so I just got bored and started sketching ideas. It occurred to me that what we really needed was for the player to get empathy with a character, and the only way that would happen is if they could actually see the face. So I thought, I'll blow the face up, so it becomes the whole character. So we did the face as big as possible – we could print something like 32 pixels wide by about 48 pixels high, and still move it around fast. And of course once you've done that, there's no point in trying to create a realistic human – you've just got to create a cartoon character. So we drew on eyes, a mouth and nose, stuck some feet on. Arms are always

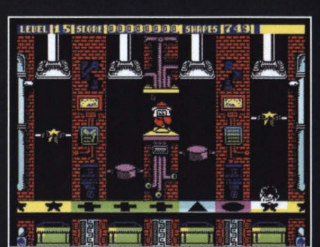


expressive so we stuck them on, too. And that's it, really. It literally took half an hour to come up with the Dizzy design."

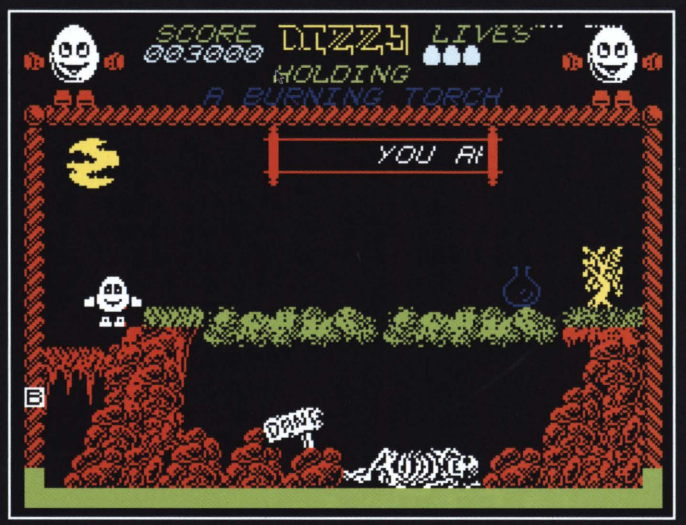
Ghost Hunters went out with a more realistic human protagonist, but the twins wouldn't let their egg-shaped character go. They started imagining a game universe to suit the character. This creative freedom was a luxury of the haphazard way in which Codemasters worked at the time. In the early days, development staff were employed on a freelance basis, which usually meant single-man teams designing and writing games from home. On top of this, coders were responsible for managing their own projects. As Andrew puts it, "They never actually commissioned anything specific and we'd never get advances. You wrote games and gave them finished masters."

Ultimate adventure

With *Dizzy*, Philip and Andrew set out, rather ambitiously, to create "the ultimate cartoon adventure." As unapologetic popularists, they wanted to capture a mass audience – which at that time was mostly young and inexperienced with technology. So they hit on the idea of theming a character-based puzzle/platform/adventure game around



The Oliver brothers managed to tease impressively intricate locations from the rudimentary Spectrum hardware



The original *Dizzy* featured familiar '80s gameplay elements such as collapsing platforms and pixel-perfect jumps. Such action set it apart from games like the Magic Knight series

fairytales – "they're rich and varied, and everybody all over the world knows them," asserts Philip. He continues, "Our basic mechanic for the gameplay was pick up an item and take it to where it can be used. Obviously, people had done that before, but they'd always done it with keys and doors, and if you make everything logical it becomes extremely boring." So these real-world devices were replaced with fairytale systems. A magic bean, dropped in the right place, would grow a beanstalk to provide access to a high platform; an impassable giant rat could be coaxed away by playing a pipe borrowed from the Pied Piper. Simple yet charming and, as would become clear, hugely effective.

The production process behind the game was uniquely slick for the time. Says Philip, "We split backgrounds and foregrounds, so one of us did scenery and one would take all the moving characters. Don't ask about music, that was just a complete bodge."

By now the Spectrum had a much bigger market than the Amstrad, so *Dizzy* was developed for Sinclair's system. The brothers hated the squidgy keyboard, though, so they wrote the game on their Amstrad, getting an electronics expert friend to design a rudimentary serial cable capable of streaming data to the Spectrum via the printer port. "All we actually typed on the Spectrum – after writing a little load routine in ten lines of BASIC – was 'LOAD "" <enter>', claims Andrew. "Then we put a tape in and that fired up the download software. Both machines were running Z80, they were very similar. They had slightly different graphics formats, but because we were generating the graphics inside a little editor we just put some options in to save out in both Spectrum and Amstrad formats." "We do the same thing with Xbox, GameCube and PS2," says Philip.

The Amstrad had other benefits apart from a decent keyboard. The machine boasted an excellent disk drive offering random access, high speed and reliability. There was also a handy chip called MAXAM, which could be plugged into the expansion port at the back of the machine. It cost £80 and gave the ability to write Z80 assembler and compile it to machine code. This, of course, is one of the reasons the Olivers could write games so quickly – they weren't tied to the slow, unreliable tape-based system of writing straight to the Spectrum.

The brothers also developed design techniques and coding shortcuts to give *Dizzy* a singular look. "We created the

backgrounds from a bank of 255 irregular-sized sprites, about 50 of them being the alphabet and numbers. Our editor allowed us to move any sprites around and drop it at any position on screen down to a pixel resolution, overlapping and 'mixing' with anything under it. To draw a tree we'd slap down several chunks of trunk on top of each other and then add some randomly placed foliage 'balls' above it: hey presto, a tree. To vary it a little further our sprite printer allowed us to flip sprites horizontally and vertically, allowing us to make things looks more unique and less repetitive. This made *Dizzy* games look quite organic and very different to other games of that time which all used aligned 8x8 graphic blocks (characters). With our method, you could describe a whole screen in a far less memory too, which let us create bigger and more interesting maps which contributed greatly to the success of *Dizzy*."

The first *Dizzy*, released in 1986, was more of a slow burner than an instant chart smash, with word of mouth winning the game enduring sales. "It went out like any other Codemasters game at the time, with no real marketing, and it didn't really sell particularly well, although Codemasters received thousands of fan letters. And what they noticed was, every game they'd ever released sold for about a month and then died, but *Dizzy* just kept selling and selling. And a year later when we did *Treasure Island Dizzy* it was still selling. And when *Treasure* was released it went straight to number one."

From here on, the Oliver twins turned into a two-man production line, writing game after game in intense six-week bursts. By *Fantasy World Dizzy* (the third title in the series) they were knocking out two maps a day, drawing them on paper first before coding. The game was finished within a month. In 1986, the brothers were responsible for seven per cent of all games released in the UK, and they estimate that in the following year around 50 per cent of Codemasters' output had their names on it.

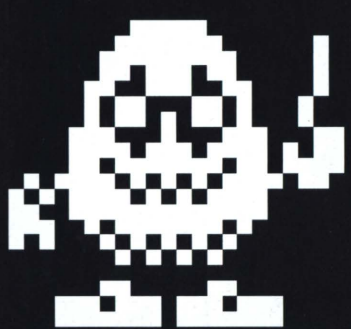
Daily grind

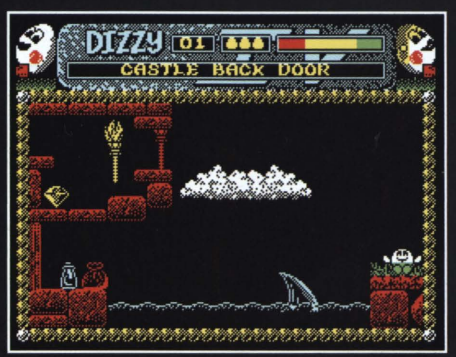
During this intense period in the mid-'80s, the pair were often programming for 20 hours a day, seven days a week. They became experts at sucking the fat out of the development process. "We wrote map editors, sprite editors, we re-used code – we'd write a sprite routine and use it for ever more. We did a random routine that was written in 1985 that we still used up until two years ago!" Later, after the first *Dizzy* titles, the brothers started farming sequels out to other developers and took on other Codies projects such as *Pinball Simulator* and *Jet Bike Simulator*. As Andrew explains, "To relieve our boredom we just did *Dizzy* game, sim game, *Dizzy* game, sim game, and every once in a while we'd chuck in something like *3D StarFighter*."

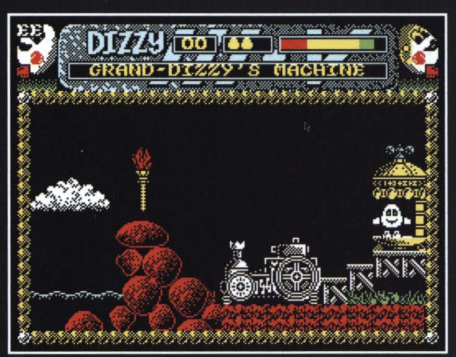
Codemasters released around 14 *Dizzy* titles across a multitude of platforms, the basic gameplay rarely straying from the original blueprint (apart from offshoot titles such as *Fast Food*, a *Pac-Man* clone, and *Dizzy Panic*, a *Tetris*-inspired puzzler). High review scores were rare, but the games maintained healthy sales. Indeed, *Dizzy* was undoubtedly the company's most profitable pre-*Micro Machines* franchise, helping it to survive its tumultuous courtroom dramas with Nintendo and Sega. Ironically, the only instalment to win any kind of industry award – 1991's *The Fantastic Adventures of Dizzy* on the NES – would be the Oliver twins' final *Dizzy* release. As Codemasters plunged into a mega-money lawsuit brought against it by Nintendo for bringing out the Game Genie cheats device, the twins felt game development was suffering in the intensely political atmosphere and left soon after, having completed a couple of *Dizzy* titles which were never published.

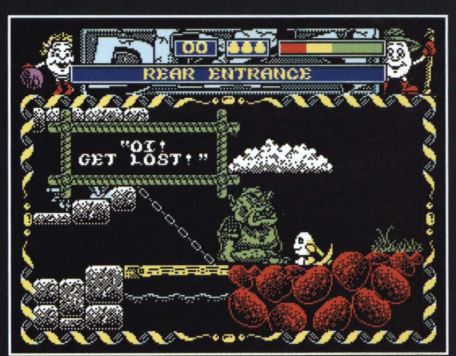
In 1991, the brothers set up their own development outfit, Interactive Studios, which changed its name to Blitz in 1999. Intriguingly, the legacy of *Dizzy* lives on in the company's current output. Recently released cel-shaded Warner Brothers licence *Taz: Wanted* and forthcoming adventure title *Zapper* both feature sharp, colourful environments, well-realised characters and surreal puzzles – the building blocks of the *Dizzy* series. The Olivers are still going for the mainstream, charming the masses, and slipping under the radar of critical attention. They are content with that.

Later *Dizzy* titles tampered little with the classic gameplay – even when the Olivers subcontracted the work out to other studios such as Big Red Software









The name *Dizzy* comes from the fact that the Olivers' egg-shaped hero does cartwheels as he moves. This feature was only included because the brother's proprietary sprite editor had a sprite rotation facility written in and they fancied using it

StarGlider

Aged 19, Jez San taught the Atari ST to sing while coding the ambitious *StarGlider*. The title's subsequent success shot him into 'The Times' rich list and established Argonaut as a bona fide industry player. He tells **Edge** about the early years

StarGlider was – quite literally – a game that sang. When developer Argonaut released versions for the Amiga and ST in 1986, it astounded the world by producing super-crisp song lyrics (albeit among a composition of slightly questionable worth). This ensured that the game was run on every demonstration machine in Dixons, and generated enough cash and interest to launch the company now responsible for the *Harry Potter* games into the industry's premier league.

Jez San was just 19 when he started coding the game, and explains how *StarGlider* actually came out of a failed bid to gain the rights to 'Star Wars': "I was talking with their lawyers, but negotiations didn't work out so I deviated from my plan. I created an original 3D game that had storyline, animation, sound samples and many other firsts for a 16bit game – even though nothing gives you a rush as much as 'using the force' on that original 'Star Wars' coin-op did for one million bonus points."

Anyone entering the game world for the first time would recognise the vector style reminiscent of some of San's favourite games – including *Battlezone*, *Elite* and *Star Wars* – which he quotes as inspirations. Nevertheless, *StarGlider* developed its own distinctive game universe, which was bonded together by a tremendous narrative

Original format: **Atari ST/Amiga**
Publisher: **Rainbird**
Developer: **Argonaut**
Origin: **UK**
Release date: **1986**

Finding and skimming over those vital fuel lines was necessary at key moments of *StarGlider*. As the game progressed, however, the Egrons would begin to defend the towers with heavy tanks and walkers

The game was run on every demonstration machine in Dixons, and generated enough cash and interest to launch Argonaut into the industry's premier league

line. "I originally had [the player] shooting the tops off towers, just like the *Star Wars* coin-op," explains San, "but when I didn't get the rights I made my game more story-led, more free-roaming, and ultimately a deeper game than the one I originally wanted to do."

An impressive feature was the game's attention to detail – it came beautifully packaged with a flight manual, a novella, a functional key guide, and a poster of your AGAV vehicle. The story was based on Novenia, a dying planet ravaged by nuclear fallout and the invasion of the evil Egron empire. The novella was a welcome touch, which managed to establish the game world incredibly well before play. "My agent, Jacqui Lyons, was also a literary agent," says San. "She represented a very good novelist called James Follett (the brother of Ken Follett), and he penned the novel and helped with the characters. But most of the storyline was inspired by the game."

Interestingly, the vector style of *StarGlider* was explained in the novella by the post-apocalyptic state of the planet. Plausible reasons were given for why the planet was dark and how your hero could see through structures and enemies.

Simply flying around the *StarGlider* world proved a worthwhile experience in itself, and whenever an enemy installation or walker was encountered the temptation to shoot it until it disintegrated into a cloud of pixels was overwhelming. However, subtler techniques needed to be employed to stay alive in the long run. Enemy strategies developed at a fast rate, and as the levels went up their numbers and cunning would increase. Gung-ho blasting would be rejected in favour of a more tactical approach. Chief among these were managing to recharge your energy shields by carefully following the power lines while avoiding the deadly missile launchers.

The main objective of the game – to take out StarGlider 1 – could be incredibly tricky. Once it appeared, a missile would have to be collected from one of your silos. The mothership would then have to be tracked at the perfect speed before you launched your precious rocket. Once fired, your cockpit view would alter to show the camera directly behind the missile (an unusual technique at the time). It would then have to be directed to StarGlider's weakest spot – its underbelly – to damage the hull. Three direct hits were required.

One of San's proudest moments during the game's development was discovering a way to make the ST's sound chip sing: "The sound chip had no analogue output and certainly no waveform. I opened up the Atari and put a voltmeter across the outputs of the sound chip, and by playing with the volume control of the three sound channels and measuring the voltages of how they interact I built up a lookup table that allowed me to play waveforms on hardware that was in theory not capable of doing it. Hence people were astounded by the lyrics to the *StarGlider* song that you hear when the game boots up. It sounds simple now, but back then this was a major technical achievement."

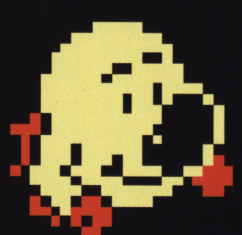
San had never done anything on the scale of *StarGlider*. It was a bold game to attempt, but, as with all classic games, its elements came together to deliver a sublime challenge

Although San had experience optimising assembler code and had programmed a few titles, such as *Skyline Attack* on the Commodore 64, there had been nothing quite on the scale of *StarGlider*. It was a bold game to attempt, but, as with all classic games, its elements came together to deliver a sublime challenge. But even San required help towards the end, and describes the process of bug finding '80s-style: "My friend Gary Sheinwald was my producer at Rainbird. During the last few days of the games development we took shifts. I stayed up all day and night fixing bugs while he slept next door. When I'd fixed them I'd wake him up, and then I'd go to sleep while he tested the game to look for more bugs. We alternated like this for several days, but it was very effective and got the game out.

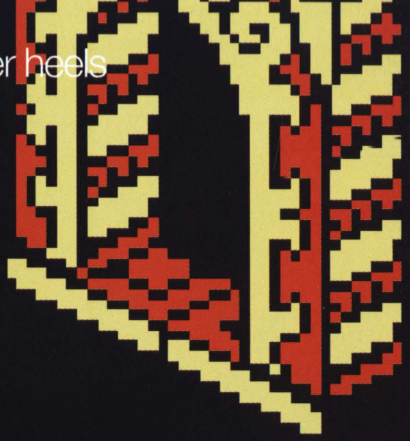
"Part of me prefers the old days," he continues. "When you could program in assembler and make machines do things no one even dreamed of. That was what drove me back then – not the money, but the achievement of writing fast code that did something cool and new." Indeed, San's name has appeared in the annual 'The Times' Rich List (he occupied 198th place with a £150 million fortune), and he is a constant reminder of just how the industry has changed and how far the bedroom coders of the '80s have come. "[Back then] the business and finance community pooh-poohed games companies," San recalls. "It's a little different now. Back in the 'ol' days' we used to get a few thousand pounds as an advance. It was the royalties that did the big numbers. I lived quite lean for a couple of years off that advance while finishing *StarGlider*. Luckily, I still lived with my parents, so expenses were minimal (cinema and pizzas were my outgoings). But when the game came out it flew off the shelves and made a fortune for a young kid like me, and gave me the start I needed."

But does the *StarGlider* legacy haunt San? "No, I'm never sick of hearing about it. Argonaut is now a thriving game developer with nearly 150 people. It helped put us on the map – and got me my first big cheques. The royalties from *StarGlider* allowed us to expand to six people and then to ten. Then we wrote *StarGlider 2*, *Birds of Prey*, and a number of other titles."

The passion to produce cutting-edge software and push hardware to its limits is still very much a part of the Argonaut philosophy. You merely need to experience the intensity of the company's *Alien Resurrection* on the PlayStation for confirmation of this. But San also seeks to harness technology in new ways. "These are interesting times. A couple of years ago we spun off a hardware division and made it into a separate company, and this has gone from strength to strength. It went public and is called ARC. It designs a fantastic type of RISC microprocessor that's customisable and configurable by its users. It may well change the world of electronic product design. And to think it all started at Argonaut." Built thanks, of course, to those early *StarGlider* cheques.



Original format: **Amstrad CPC/various**
Publisher: **Ocean**
Developer: **Jon Ritman/Bernie Drummond**
Origin: **UK**
Release date: **1987**



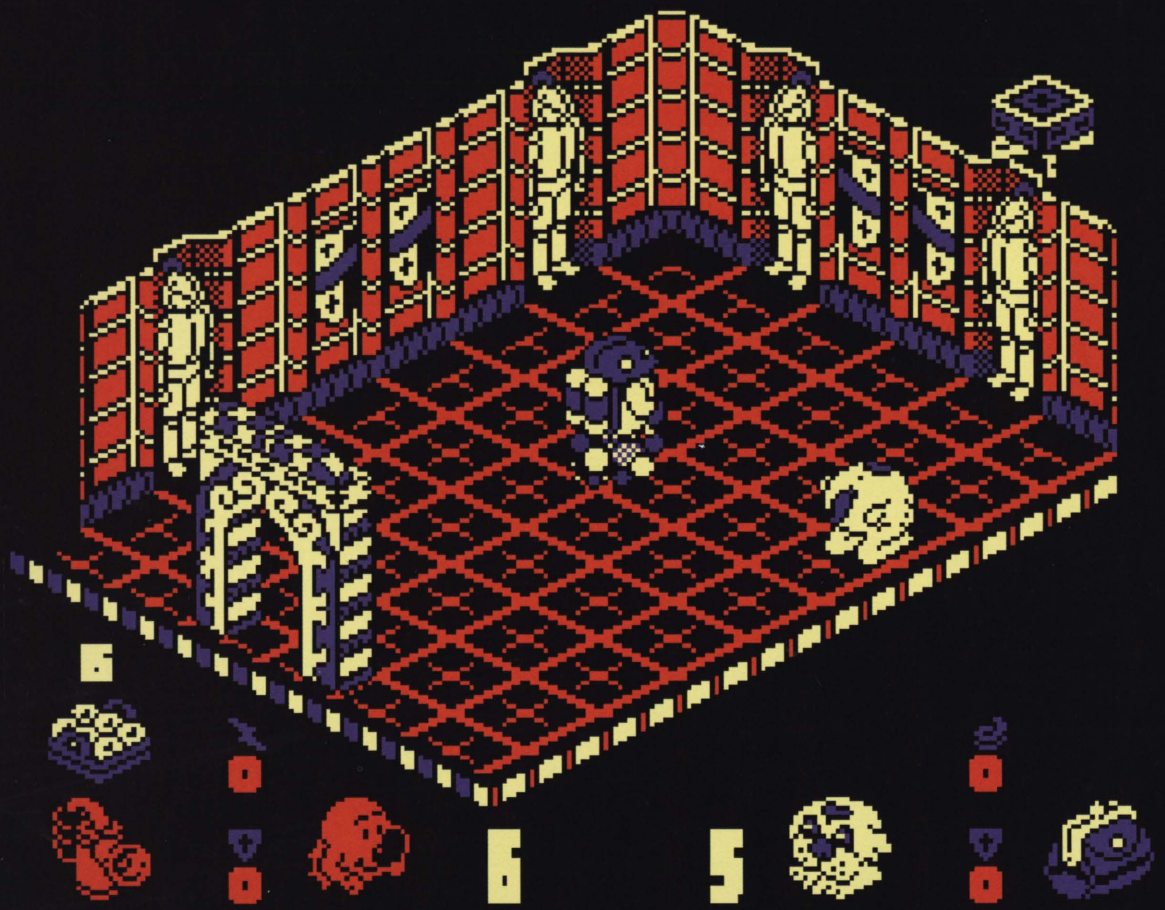
Head Over Heels

It was based on old code, inspired by an earlier title, and had its plot lashed together in a matter of minutes, but Jon Ritman and Bernie Drummond's opus ended up a masterpiece. **Edge** finds out how

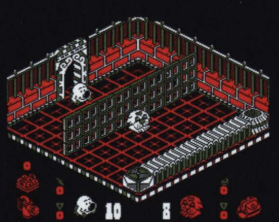
Head Over Heels was blatantly modelled on *Knight Lore* and borrowed 80 per cent of its code from another title. Hardly credentials to assure the isometric puzzle game a place in the annals of videogame history. But that last 20 per cent of code, brilliantly conceived and honed to perfection, explored new territory in terms of character co-operation and level design. Indeed, the symbiotic partnership at the heart of the game demonstrated an audacious level of sophistication.

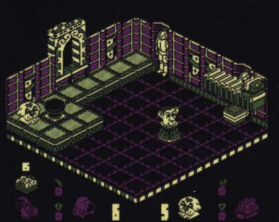
Fittingly, Head and Heels were born out of an alliance between artist **Bernie Drummond** and coder **Jon Ritman**. "Jon had this idea of symbiosis after watching a programme about animals which could combine together in nature," explains Drummond. "It was his idea, but I vaguely remember this Marvel Comic version of 'Planet Of The Apes' back in the '70s. There was a story in which a gorilla and a human teamed up. The gorilla's arms were broken and the humans legs were broken, so the gorilla gave the human a sort of piggy back. When Jon suggested the idea, I took it in that direction."

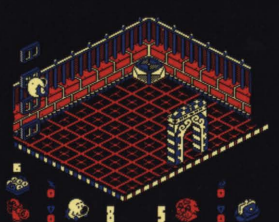
While Drummond imbued the game with its distinctive surreal quality, Ritman concentrated all his efforts on game design. "I worked on all the Z80 versions," he recalls. "The Amstrad CPC, the Amstrad PCW, and the Spectrum. But at the time I never thought of *Head Over*



Head and Heels began their quest in the same location but could not join forces due to the barrier which divided the room. Once together, their combined skills allowed them to overcome increasingly complicated puzzles





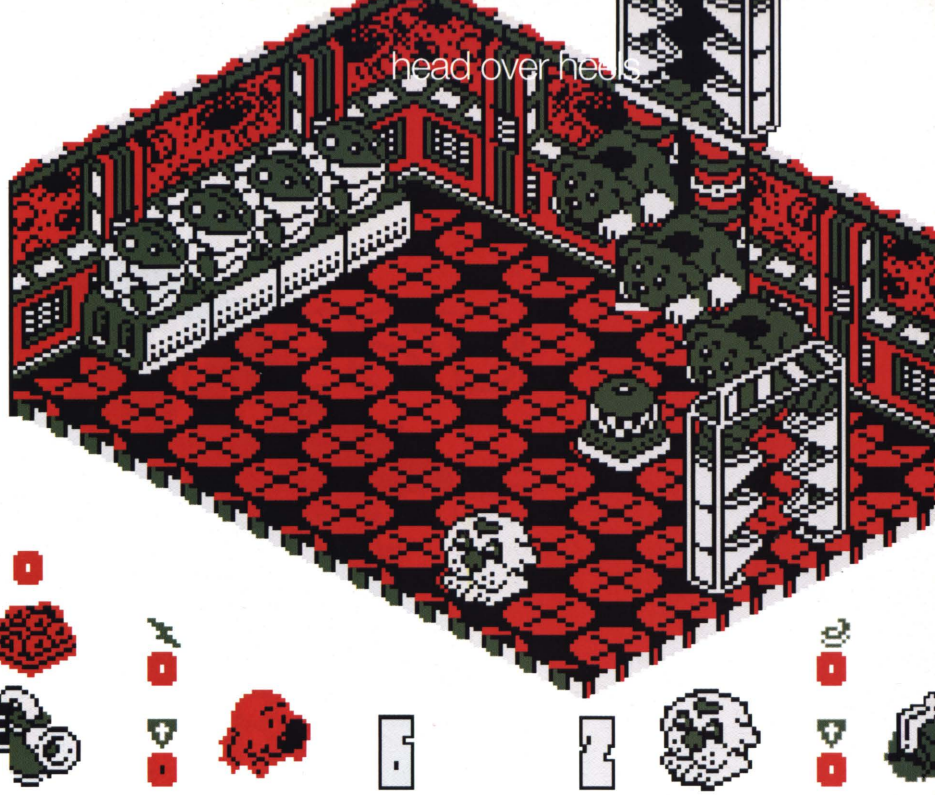


Heels as groundbreaking. *Batman* came first, and *Head Over Heels* was virtually the same code. I can clearly remember thinking that this new game was just a way that allowed me to get more variables into the amount of puzzles."

Ritman's masterstroke was to take the existing isometric puzzle game formula – famously pioneered by Ultimate's *Knight Lore* – and add a staggering level of intricacy by creating two characters which could join and separate at the whim of the player. Head was granted the power to jump to high places, while Heels – a dog-like character – could move fast over flat surfaces. Further puzzle combinations were provided by the tools Head and Heels could discover during the game. Separately, the duo could only operate to a limited degree, but together they shared their skills and could overcome vastly more demanding puzzles.

"I was frequently coming up with quite complex problems which would include a mental element plus a physical element," reveals Ritman. "There's a room near the beginning of the game which has a Dalek with a Prince Charles head on the top. That's where you get the bag for Heels. Initially, that was far more complex and had a lot of mental stuff in it. But when I watched a friend play it I realised that there was a problem. If someone thought they solved a mental element and then failed the physical test because they didn't make a jump, they would then assume they hadn't solved the mental puzzle even though they had. They would start trying other stuff. I realised I had to separate the two. So, I would put a mental puzzle with minimum physical problem in one room, and then a physical problem with minimum mental problem in the next room. It was the only way that made it work."

Though Ritman created and implemented all the puzzles in the game, Drummond's artwork provided much of the inspiration. With a simple draw program – and little computer experience – the 19-year-old artist began experimenting



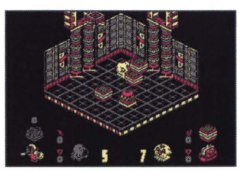
by moving pixels around the screen until images began to form. "I did have a surprisingly large input considering I was new and didn't program," recalls Drummond. "At first I didn't really know what I was doing and I was turning pixels on and off in this little box. If you looked over my shoulder after 20 minutes it would look like a Rorschach test. If you looked half an hour later you would just go, 'Fuck, that's Ernest Borgnine – how did you do that?'"

Drummond's improvised approach to graphic generation alongside his surreal style inspired many of Ritman's design decisions. "My look was a cross between Dali and Disney," he adds. "Jon never rejected anything. I used to give him 12 pictures, and there would be a Welsh dresser, a suitcase, or a stack of bricks on a hod. Jon would go, 'What is that? It's gorgeous'. He would utilise them slightly better than I'd imagined. I saw them as pretty pictures, whereas Jon would go, 'Four dogs as a staircase? We'll make it so Head can't use them because dogs don't walk on dogs.'"

doughnuts to paralyse enemies – a result of the creature eating the food. Stairways made of sausage dogs would disappear whenever Head appeared in the room – they were scared of their canine rival, ran the logic. Players could constantly alternate between the two characters, thus avoiding the frustration of encountering a single puzzle which could not be cracked. Although Head and Heels began life apart, one of the game's main goals was to bring them together. Teasingly, Ritman placed a room close to the start in which both characters could see each other but not actually meet. It was a inspired touch which typified the game's charming design.

Ritman developed *Head Over Heels* simultaneously for all the Z80 machines. He was strict with his coding, ensuring that only three routines needed to be altered to port it over to any of the formats. But it was Ultimate's seminal *Knight Lore* which spurred Ritman on towards producing elegantly designed and coded game

"Immediately after seeing *Knight Lore* I just wanted to do that. It was the best thing I'd ever seen. It's like where you were when Kennedy died"



The design of *Head Over Heels* was a glorious example of instinct over method. Ritman didn't plan a thing. He added rooms one by one and left the code which joined his characters until the very end. The approach belied a game which exuded an air of delicacy and sophisticated structure – qualities which only crystallised towards the very end of development. Spanning five planets and a moon surface, the game contained a massive 301 rooms. With such an eclectic array of graphics at his disposal, Ritman had little option but to build a bizarre story around the two central characters. As two spies from the planet Freedom, read the blurb on the game cover, Head and Heels are sent to liberate the Blacktooth Empire. "I made the whole game up and then added the bullshit in the last ten minutes," admits the coder.

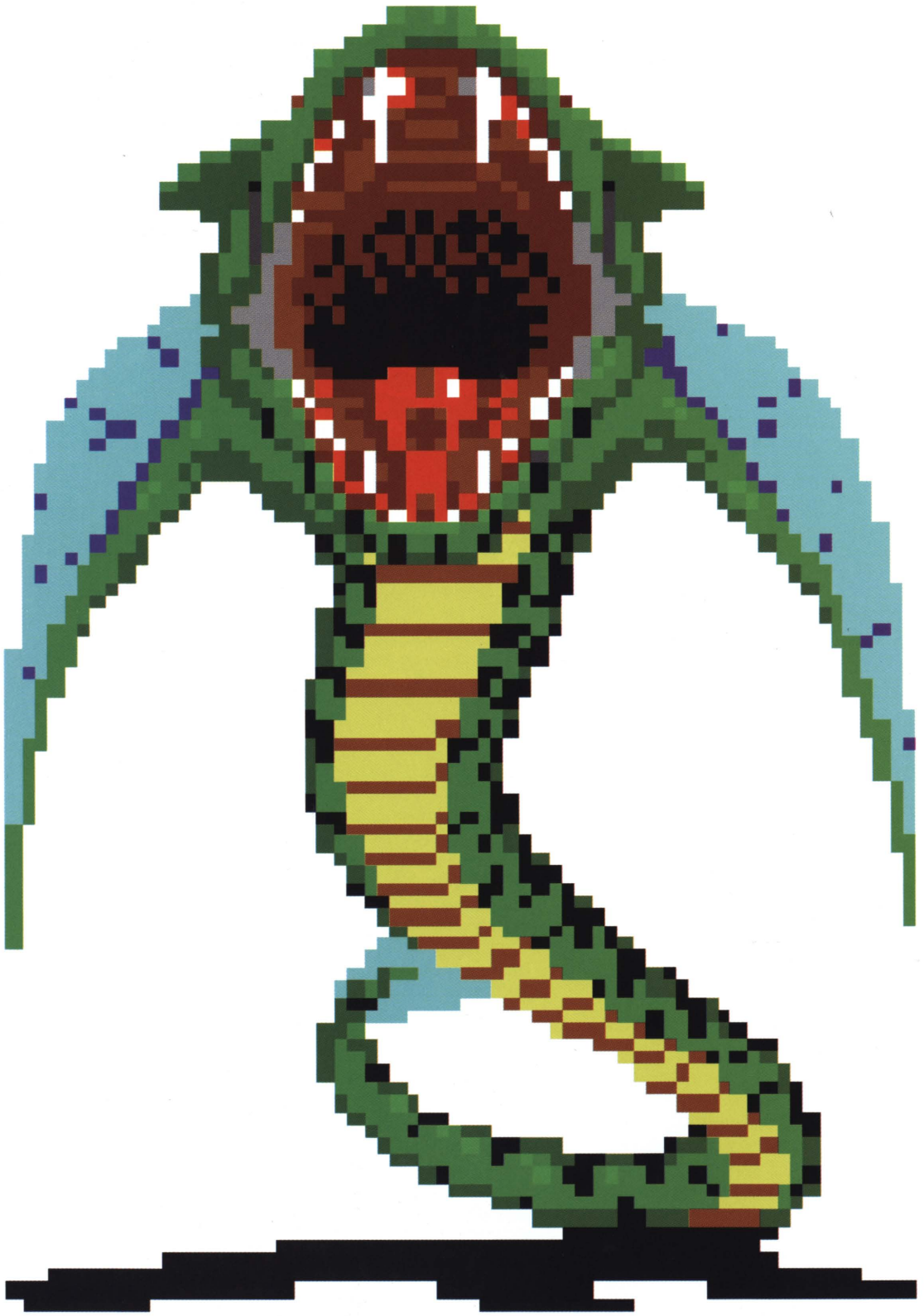
But for all its Dali-inspired imagery, *Head Over Heels* demonstrated a reliable internal consistency. Heel's hooter would fire

experiences. "Immediately after seeing *Knight Lore* I just wanted to do that. It was the best thing I'd ever seen. It's like where you were when Kennedy died. I've talked to Chris Stamper since then about *Knight Lore*, and I know that the efficiency of *Batman* and *Head Over Heels* was so far beyond *Knight Lore*, particularly in the way the graphics were generated. He used a 6K buffer – 6K out of 48K is quite a serious hit. I used a 256-byte buffer – a huge difference, which gave me enough room for the whole map."

The only way Ritman could cram all the data into the buffer was to use a grouping routine. "The whole map was contained in 5K. It was a bit-streamed map format with lots of optimisation. I put individual bricks down and then, for instance, grouped together a row of eight bricks. In memory terms, I could then put down that whole row as if it were a single brick. It might only take a byte to put that down, so a byte of memory and you have a row of bricks."

The game took nine months to complete, and once finished only the small matter of the game's name required tweaking. "The working title was very appropriate nowadays," laughs Ritman. "From the very beginning we called it *Foot And Mouth*. It started off as a joke, but by the end of nine months we were getting attached to it. I took it to Ocean, but they just said, 'You've got to be joking'."

Some games shake the gaming firmament with an original concept, others startle with groundbreaking visuals. While *Head Over Heels* did neither of these things, its purity of level design, imaginative puzzles, and character mechanics placed it a world apart from its closest rivals. "But its greatest achievement is that it is still valid as a game," concludes Ritman. "When I look back at *Head Over Heels*, particularly on the Amstrad where it was very colourful, I just think it still plays incredibly well. It was special."

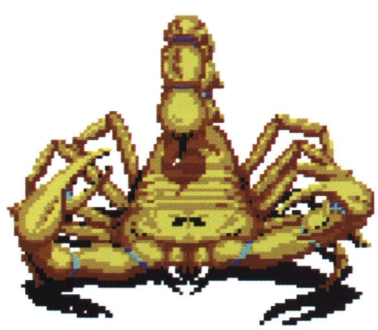


Dungeon Master

With tactile environments, a sophisticated spell system, great puzzles and a gallimaufry of creatures, *Dungeon Master* was one of the most influential games of its generation. Was magic in the air? For the Californian team behind the game, its inception was a truly remarkable one

Dungeon Master cast a powerful spell over those who entered its famous doors back in 1987. With its enchanting environments, colourful characters and sophisticated magic system it had the power to affect every waking moment. But for true fans, the cracked walls of Lord Chaos' domain became a way of life, ensuring that many an Atari ST disk drive rumbled long into the early hours. And while it is still possible to go back and free Tiggy, Wuuf, Daroou, Hawk et al from their entombment in the Hall of Champions, the magic of encountering this game within its cultural milieu is forever lost. The Californian team who lavished so much attention on one of videogaming's most cherished titles are similarly elegiac about the past.

"We were developing games during a magical transition time where games were evolving by leaps and bounds," states **Andy Jaros**, lead artist. "I like to compare it to late '60s rock. There was a great deal of undiscovered, untried styles to go around. The revolution of colour graphics, the mouse, even full sounds, had all come about quite recently and there were so many ways to employ these tools that we all had to innovate just to use them."



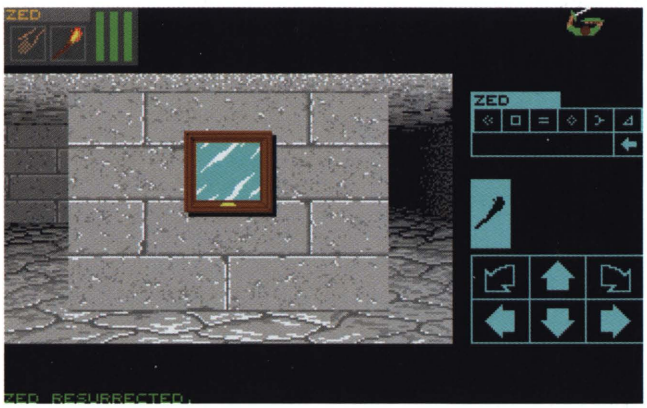
It was a small office in San Diego which saw the emergence of the multi-layered *Dungeon Master* concept. All friends, the FTL team would approach work in a leisurely manner by day and work like demons by night. "We used to have the refrigerator stocked with sodas and beer and frozen food," recalls **Dennis Walker**, assistant director. "We'd have the stereos cranked up and it was sometimes like a working party. It was a lot of fun because we were all being creative and we could tell we were on to something that was going to blow people away. All we started with was a way to draw a 3D dungeon, and that was it. There wasn't much backbone to it. The goal was to put some meat behind the pretty graphics, to create a functional world. We were creating a mode of reality in essence, and the reality was an evolutionary process."

Certainly, *Dungeon Master* changed the way RPGs would be constructed for the next decade. An intuitive interface coupled with detailed environments brought a level of involvement rarely experienced within the genre before or since. The addition of fully 'tweakable' elements within the game world, including a bewildering array of objects which could be used by the four champions, gave the game its unique tactile quality. "Unlike the simple, mono-dimensional worlds of most games of the time, you had the sense that the *Dungeon Master* world was really 'alive'," points out **Michael Newton**, second unit director. "You could throw something down the hall, descend the stairs, come back up, and find where it hit the wall and dropped. You could pull a lever in one spot and have that release monsters elsewhere in the dungeon, and in turn they would end up tripping devices."

Although point-and-click interfaces had been around videogames for a while, they had never been implemented with the rigour and refinement found in *Dungeon Master* – especially in a complex roleplaying title. Knobs on doors, items in niches, even the tiniest buttons hidden on walls could be manipulated to cause events or trigger fiendish traps. Decoration was important but almost every discernible object could be picked up, thrown, hacked to pieces or stored in the heroes' backpacks. It was an audacious achievement which puts many modern videogames, with their insistence on prerendered backgrounds and 'dummy' furniture, to shame. It was even possible to use the physics of the environment to your advantage. Certainly, no other game has quite managed to use doors to batter creatures with quite the same degree of brutality as *Dungeon Master*.

"We just didn't want to have a big empty dungeon," adds **Doug Bell**, the game's director. "The re-use of images wasn't that expensive. Most of the objects you saw took up four bytes of space each. It didn't matter what they were, you could just put them in your backpack. It was actually Wayne Holder who said, 'Why can't I just reach in and pick things up?' If there was one spark of innovation that made *Dungeon Master* the game it was, that was it. We were very conscious of making it as unobtrusive and intuitive as possible. Before, we had many specialised mechanisms – you had to go into a menu to get an overhead view, and then pick up the things around you. We

Format: **Atari ST**
Publisher: **Activision**
Developer: **FTL**
Origin: **US**
Original release date: **1987**



The Hall of Champions is home to 24 mirrors containing the visages of ancient heroes. The player could study the stats before deciding which four (or fewer) to put in the party

thought, why can't I just pick it up from the view? We just kept simplifying it."

This was indicative of how the crew worked, bouncing ideas around until something inspired the whole team. There was no strict methodology or design. Walker even tested puzzles and early builds of the game in his cognitive psychology classes at the University of California, San Diego. "I was studying things like direct manipulation and user expectation. So something simple like the 'hand' in *Dungeon Master* went through several iterations. We started with the hand being one of the eight hands of the four players. You could choose whose character's hand your cursor represented. But this ended up too confusing in certain situations and we eventually settled on what we called the third hand, or the ninth hand, if you will."

The engine, environments and interface were supremely designed with the emphasis firmly on ease of use. But these elements would have been nothing without the wonderful creatures and champions which inhabited the game world. Many were designed by Jaros, but everyone on the team provided ideas. Although some were based on D&D creatures the names were altered to avoid copyright infringement. The champion's names, too, were taken from strange and disparate sources. Daroou is Chewbacca's cousin, Halk is Conan's cousin and Azizi was the June 1975 Playboy playmate.

In the Hall of Champions hung 24 portraits of vanquished heroes, four of whom could be resurrected to help defeat Lord Chaos. As assistant to the Grey Lord it was the player's task to act as hands and eyes to the champions and guide them to victory. Choosing a good balance of characters was an important aspect of the game. A combination of wizardry, healing, fighting and speed were necessary to defeat the myriad foes in the dungeon. Developing powerful magic and potions could only be achieved if the 'mana' levels of characters was high enough. It was even possible to start your own potion cottage industry by combining spells with all the containers found throughout the dungeon.

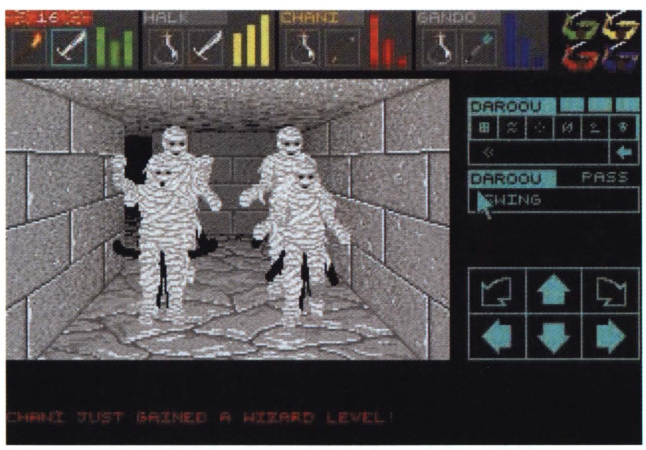
Jaros developed the arcane *Dungeon Master* magic system from an old D&D campaign idea. It elevated the combat and puzzle solving beyond anything that had preceeded it. The player could select runes which in combination could trigger a diverse set of spells and effects. Though many spells were discovered on scrolls it was possible to experiment and discover effects as multifarious as seeing through walls or banishing ethereal creatures. It was a system that was both mysterious and incredibly logical once the runes were understood.

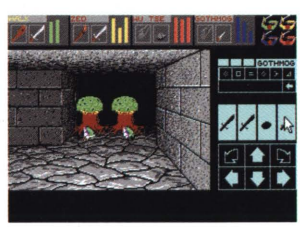
Spells, too, were required for solving the many conundrums placed throughout the dungeon's 14 levels. Bell recollects one puzzle which placed a powerful vorpal blade in a niche at the end of a long corridor. Suspicious holes marked the length of the passage on either side and grabbing the sword triggered a lethal gas attack which couldn't be avoided however quickly the heroes tried to run away. The solution? To stay put and drink healing potions until the gas eventually subsided. "I think we all enjoyed working on the puzzles," recalls Bell fondly. "Everyone who worked on the team had puzzles that they devised. You would go off and work on one and then try it out on everyone else. But we made sure the puzzles were never arbitrary. However difficult one was, when you solved it, it made sense to you. If it failed that test, then it didn't make the cut."

Dungeon Master aficionados also attest to the game's immense replayability. Playing through the game with fewer and fewer characters became an essential rite of passage for fans. Eventually, foolhardy adventurers would attempt the quest with just one of the heroes. It was an element of the game which Bell playtested vigorously himself. "My most fond memories were playing through with Hissssa. He had no mana to begin with, but he could get magic from a wand. And you had to painstakingly cast your spells for a while because you can only do one rune at a time. But by the time he reaches the end he is capable of really powerful spells. I'd always pick the weak characters because I just wanted to see if I could complete it. You had to be much more conservative in your approach to the game, you couldn't just go hacking your way through."

The dramatic, if slightly Athena-inspired cover image was the last creative decision made by the team. "Wayne hired this guy called David Darrow to do the box art," recalls Walker. "He liked to work with live models, so he had his wife dress up as a sorceress and Andy dress up as the guy pulling the lever on the wall. We wanted to have the macho dude up front with the sword kind of stepping back in surprise as the door opened, so they hired a body builder from Gold's Gym. Unfortunately when we saw the painting it looked like he was falling into the pit – not the macho image we had imagined." Thankfully, the image did little to dent the reputation of one of finest RPGs ever devised. And *Dungeon Master* surely ranks as one of the titles most worthy of resurrection from videogame's own Hall of Champions.

"We'd have the stereos cranked up and it was sometimes like a working party. It was a lot of fun because we were all being creative and we could tell we were on to something that was going to blow people away"

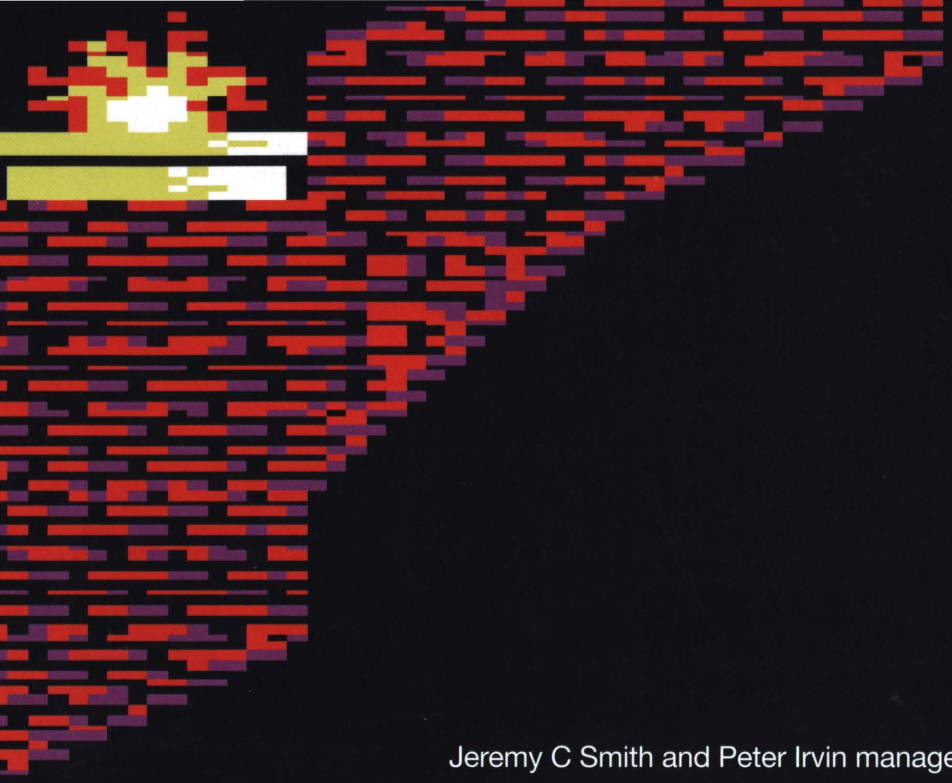




The variety of creatures were taken from a number of sources: Dungeons & Dragons, horror flicks, and, of course, the incredibly fertile imaginations of the FTL team

Exile

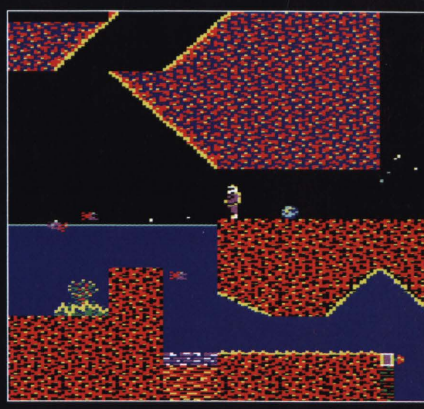
Jeremy C Smith and Peter Irvin managed to code a game on the RAM-strapped BBC that devotees have yet to complete some 15 years later. **Edge** uncovers how the pair developed the title that first introduced realistic physics to gaming



Escapism. There's this guy in a spacesuit on a distant moon, and he's being thrown around by a wind raging inside a cavern. When his feet catch the ground he tumbles head over heels, slamming into the wall with a muffled yell. He fires a bullet into the hurricane, watches it stall, curve, return and smash into his stomach. The impact throws him back against the wall and he screams again. A bird, nesting nearby, carves almost effortlessly through the wind then swoops back out. He chases the bird, firing, stumbling, spinning. Why? No particular reason, really, just because he can. Freedom of choice is the future, so let's escape.

You're Mike Finn, weary space hero. A research ship, the Pericles, sits stranded

Original format: **BBC Model B**
Publisher: **Superior Software**
Developer: **Jeremy C Smith/Peter Irvin**
Origin: **UK**
Release date: **1988**



The red piranhas are aggressive, and killing them will help the player progress. Finn can fire his weapon at any angle, useful in fights and puzzles

on the surface of planet Phoebus. Its crew is missing, their fate picked out in brief, terrifying radio bulletins from their captain. Triax, an arch-geneticist exiled from Earth for crimes against humanity, is responsible. You're underfunded and underequipped, and your mission? To rescue any survivors and to overpower Triax. Except now, Triax has stolen a crucial part of your ship, and you're stranded too. So it begins.

> "*Exile* was just going to be a man with a jetpack exploring a 2D cave system populated with objects, animals and puzzles. There was no plot, and no real development plan"

Schoolfriends Jeremy C Smith and **Peter Irvin** finished university in 1986. Smith was at Imperial College and Irvin at Cambridge, and each had found their courses sufficiently uninspiring to exclude the idea of following the traditional route into a 'normal' industry. Luckily, both were accomplished bedroom coders – Smith was the author of *Thrust*, the classic inertia-based blend of skill and planetary destruction, and Irvin had created the well-received monochrome eight-way shoot 'em up *Starship Command*. They decided to work on a project together. "At the time I was writing a game which had a wizard exploring a cavern filled with water and monsters," Irvin says. "I shelved it when we decided to team up to do *Exile* on the BBC, though the *Exile* code was built on the Wizard engine, rewritten five times over."

Despite their coding background and obvious love of all things sci-fi, the initial direction for the project was unclear. "At inception *Exile* was just to be a man with a jetpack exploring a 2D cave system populated with objects, animals, and puzzles," continues Irvin. "There was no plot, and no real development plan. We just set about making incremental changes, adding new technologies, and seeing where it led us. It was very much development by evolution."

As happens with evolution, *Exile*'s development took place at the very limits of what was possible, right from the very start. "Just compiling the game was right on the edge of being possible all the time because of the lack of RAM," Irvin recalls. "The source code was broken into lots of modules, each loaded from floppy and compiled in sequence. As time went on, these had to broken down into smaller and smaller files just to fit in RAM with the object code."

Without the luxury of a network or version-control software, Smith and Irvin resorted to other methods of working in parallel. "We wrote down on paper the routines we'd changed, and occasionally merged the two sets of game code. We'd written various utilities to help, for example to compare the modules for differences, but the whole process was a bit of a nightmare to merge." Arduous, yes, but out of the toil emerged a planet: Phoebos. The landscape was generated by a fast map function which took each x-y co-ordinate and created tunnels, solid rock, or a special block with a manually defined object in it. Objects could be doors, guns, items, or, so important to *Exile*'s vibrant planetscape, the natural inhabitants of Phoebos.

Populating the caves with myriad lifeforms, each exhibiting strikingly different behaviour patterns, seemed like an impossible task. Irvin explains

The urn, found early on in the game, can be filled with water and used to extinguish fires. Knock into a wall or accelerate too quickly while you're carrying it and the water spills out

how it was achieved: "Each creature chooses a target as its main focus of attention to follow or shoot at. It does so based on a list of criteria. Does its target belong to a certain group? Maybe it's a type of animal, an evil robot, a friendly imp, or whatever. What 'mood' – damaged, hungry, or whatever – is the testing object in? Is it in its line of sight? How far away is it? And so on, and so on. This single routine instantly gave us wasps behaving in realistic swarms, animals that attack then give up

The fact it was impossible to die meant the player was free to experiment with dangerous solutions to puzzles. It was a massive, deadly world, and an exceptionally difficult game

when you back off, turrets that exhibit intelligent attack patterns. All it required was a few bytes of data for each object, and then the same piece of code for everything." Simple, except for a few small problems with the mischievous imps. Irvin remembers: "There was a bug where they'd clamber out of their nests, up the walls, and swipe the gun

The first structure Finn encounters on Phoebos is the abandoned exploration ship, the Pericles. In order to get into the caverns below, he must destroy a locked door with a bomb, found concealed in a nearby bush

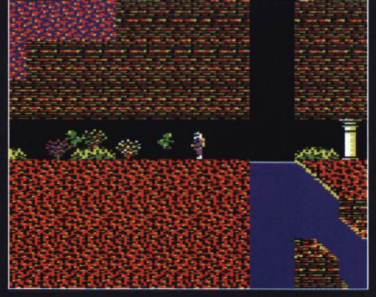
Exile's single level structure meant for an utterly non-linear experience. If the player became stuck in one part of the planet, exploration of another would provide a change of scenery and direction

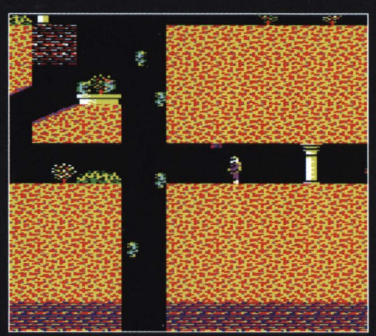
turrets off the roof, or try and make off with the huge robots."

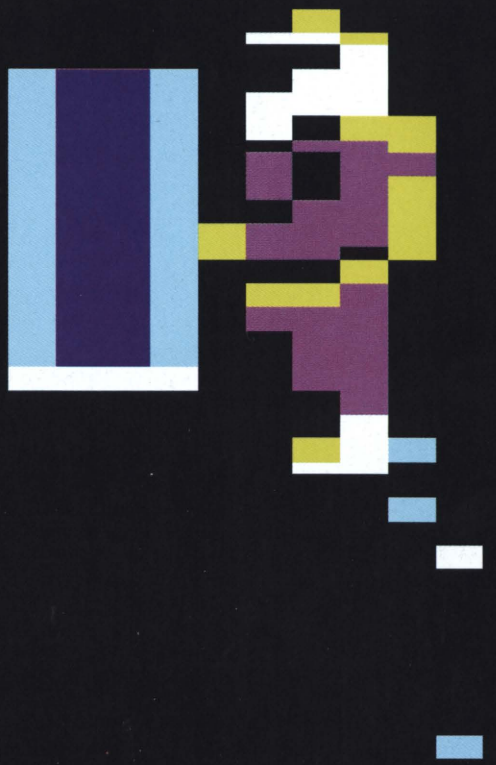
Enemies or more subtle object-based puzzles would block progress through the intricate cavern system and towards Triax's lair. Stealth and skilful flying could outwit the killers; equally effective would be a volley of fire from one of the five particle-based weapons strewn around the game world. Puzzles required a little more subtlety, but solving them remained a world away from the esoteric try-everything-with-everything-else methods seen elsewhere. Because the rules of *Exile* were grounded in real life, in gravity and mass and inertia, so were the answers to its questions. It's easiest to give an example: holding a heavy rock provided you with enough weight to counterbalance a strong updraft, and finding a jetpack booster gave you the added thrust needed to move downwards through it.

Equally crucially, the fact that it was impossible to die – if you were badly injured then your protection suit would automatically teleport you away to one of four self-set locations – meant the player was free to experiment with dangerous solutions to puzzles as much as they liked. It was a massive, deadly world, and an exceptionally difficult game. "Some of the really obsessive fans haven't even finished the game – I doubt there are many people who've even got as far as causing the earthquake that floods the caves, or finding the maggot machine or the surviving colonists," says Irvin. "In retrospect, I guess we should have made it much smaller so that more people finished it, then made a sequel."

Naturally, the game's success led to conversions for more powerful formats. The Amiga and ST versions benefited from a massive increase in available RAM, resulting in better graphics and walls that were no longer restricted to 45° angles, but when it



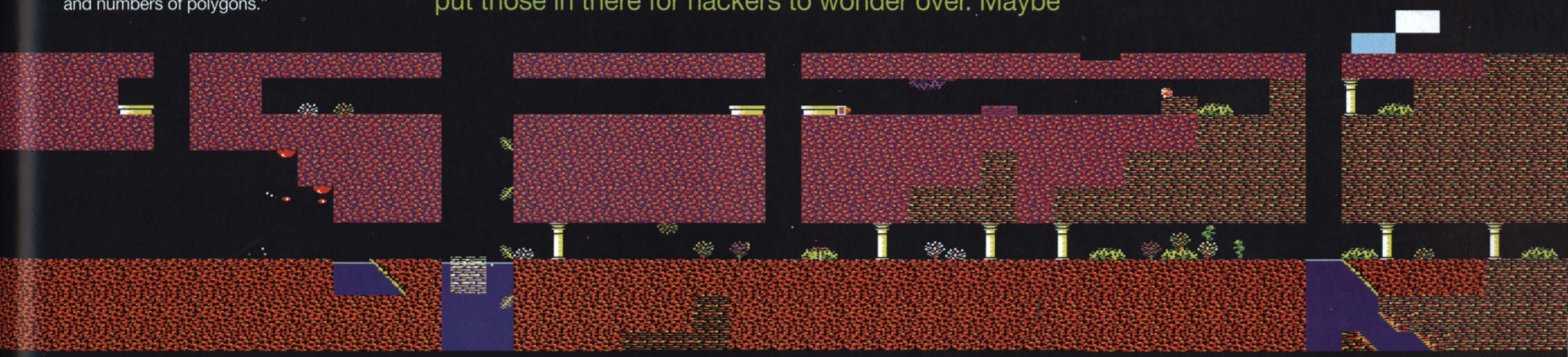




came to saving on the CD32, memory became a problem again. "The saved game had to fit into a pitifully small amount of non-volatile RAM. Each byte that had to be saved had unused parts of the bitfield stripped, then was subtracted from its most likely value. Then, after several other compressions, it was finally stored." A generational leap in hardware meant nothing – the host machine was still being pushed to the limit.

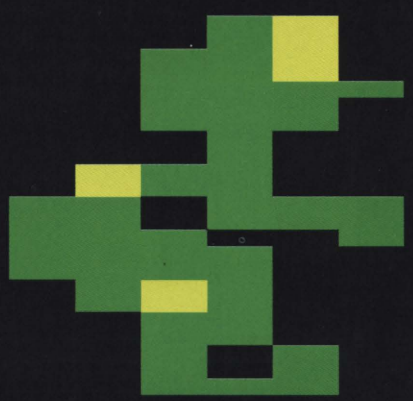
Might it be possible to test today's more complex hardware with a new *Exile*? "Quite a few people ask about a sequel or updated version: after all, the hero, Mike Finn, has only had one adventure so far, and Triax lives on. I'd quite like this to happen, but only if it was better than the original, which means really concentrating on having the same immersive atmosphere and gameplay." That's not the only reason why Irvin has hung back from recreating Finn's universe. "I think it's only recently that computers have become powerful enough to do what I'd like to implement in a really detailed realistic 3D world for *Exile*. It's not just a matter of pretty bitmaps and numbers of polygons."

"People keep asking about the extra text messages in the 68000 version, like 'She wants you badly'... We put those in there for hackers to wonder over. Maybe"



Sadly, Smith passed away in 1992. Irvin still works in the games industry for his own company, Inventivity (www.inventivity.co.uk). He's remaining quiet about his current project, but reveals that it's a game designed to work on every platform from PDAs and Smart phones upwards, and that it has been allowed to evolve from basic principles, just like *Exile*. For now, then, those desperate for a sequel will have to be content with playing around with the versions of the game already available. "People keep asking about the extra text messages in the 68000 version, like 'She wants you badly', or 'You have killed Triax'. We put those there for hackers to wonder over," Irvin says. "Maybe."

The smiling secrecy is understandable. Why put any rumours to rest? In less than 150K of data, within 32K of RAM, Irvin and Smith created a world which still lives on today. It lives in the tribute Web sites, it lives through emulation, and it lives through the dedicated conversion projects. Most of all, though, it lives in the heads of those who played it. That's where Mike Finn is now, circling through the caverns of Phoebos, thrown around by the particle winds, spinning around in the sparkling black. That's *Exile*. That's freedom.



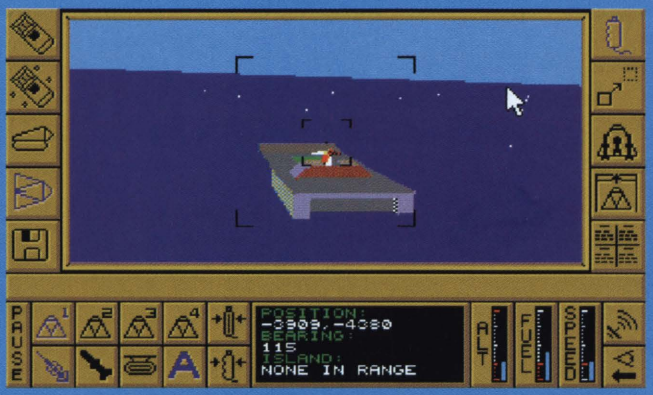
Carrier Command

Publisher problems, rapidly changing plans, and a frantic development period: **Edge** boards RTS precursor *Carrier Command* and talks to coders Ian Oliver and Graeme Bird about the groundbreaking title

Original format: **Atari ST**
Publisher: **Rainbird**
Developer: **Realtime Software**
Origin: **UK**
Release date: **1988**

The original design brief was optimistic, to say the least. Armies of soldiers were to disembark from carrier craft, plunge through knee-high water, and fling themselves on to beaches in a fight to the death with war-crazed rivals. The *Carrier Command* which eventually emerged from Realtime Software's development hell may not have offered such dynamism, but its grace and strategic depth inspired a legion of clones.

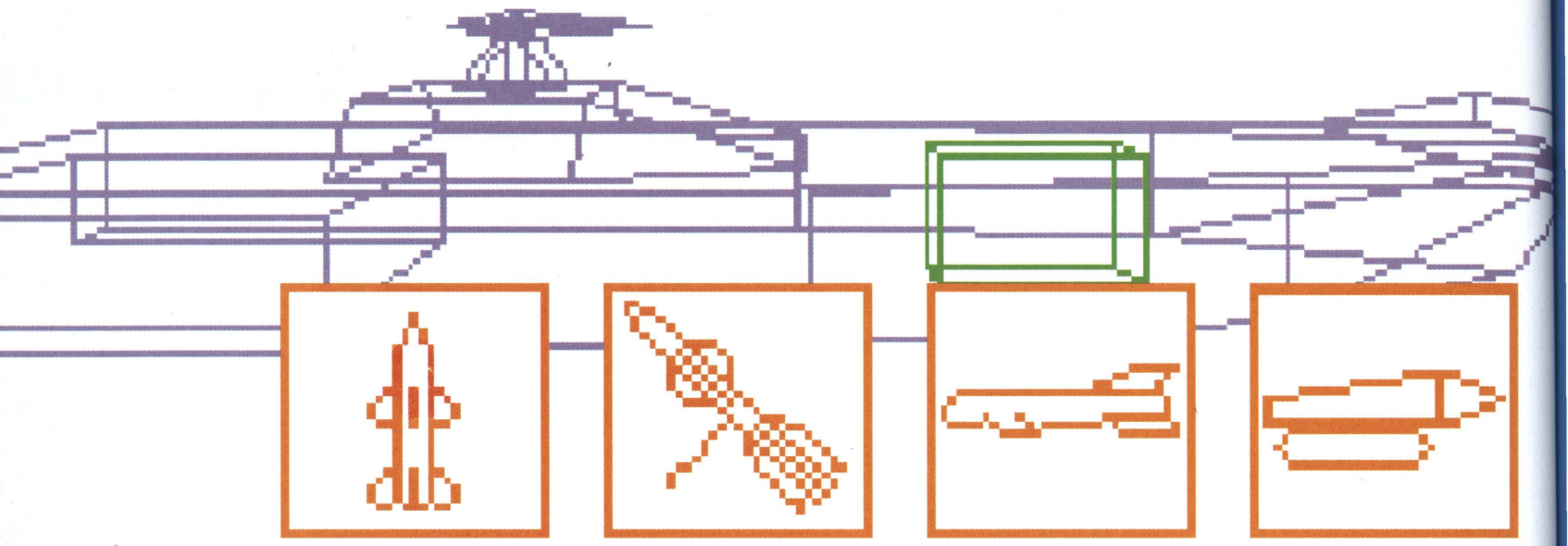
The title's evolution was a convoluted one. Realtime's trio of coders – **Ian Oliver**, Andy Onions and **Graeme Baird** – had been busy converting *StarGlider* for 8bit formats when Rainbird offered them a contract to develop a complex submarine combat game. "The idea was that mankind had been forced into the oceans after an alien invasion," recollects Baird. "You had to build underwater cities to produce your submarines, mine manganese nodules from the sea floor to power them, and build up your forces to oust the aliens. It was called *Submarine Combat Simulator*, which explains why *Carrier Command* was referred to as *SCS* throughout its development. Unfortunately, Rainbird had a falling out with the designer, and as the copyright issues over the design could not be resolved the project was ditched."



Playing *Carrier Command* back in '88 was an exhilarating experience. Manta fighter planes could be fuelled up and set on autopilot to do a flyover above the SS Epsilon

Realtime had already coded a substantial part of the game, and the contract still held. Rainbird held a crisis meeting, and eventually a single-page fax with a few bullet points landed on Baird's desk. It was to be the new outline for *Carrier Command*. "I remember being very dubious about it to start with," relates Baird. "I think they originally were thinking along the lines of the American fleet island hopping towards Japan in WWII, rather than the futuristic scenario we ended up doing."

Rainbird's Clare Edgely provided many of the initial ideas for the game, and design consultant Riccardo Pinto helped shape the overriding concept. "I guess Clare was involved in the brainstorming at Rainbird, and I'll happily accept it was her idea," concedes Oliver. "Riccardo was assigned to help us take the idea and run with it, but boy could that guy run fast. His design was massive and called for armies of



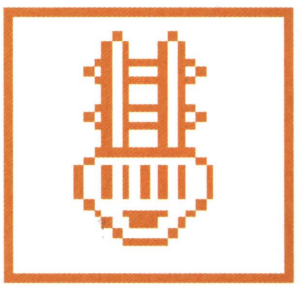
3D-rendered soldiers throwing themselves on to the beaches. But among all of this input was stuff we could use with ideas and inventions of our own."

Carrier Command was an engineering triumph and an armchair strategist's dream. The goal was simple, but reaching it called for meticulous planning and quick thinking under pressure. Faced with an archipelago of islands it was the player's task to take his carrier, the SS Epsilon, and build a supply network which would eventually spread across every territory. The challenge was made harder by a maverick carrier, the SS Omega, which was attempting to control the sector as part of a terrorist campaign.

It was *Carrier Command*'s range of sophisticated toys which became its defining feature. The SS Epsilon could open up like a toolbox to reveal compartments full of wonderful possibilities. It was armed with Manta fighter planes, Walrus amphibious craft, defence drones, and a host of resources including weapons, fuel, and base-building pods. "At the time we thought *Carrier Command* was groundbreaking because of the graphics," says Oliver. "But looking back, it's probably more so for the first of what are now *Command & Conquer*-style games. It really wasn't a game style people were used to, for both the depth of the objectives, the multiple viewpoints into the world, and the way the world was rendered."

Another striking feature was the comprehensive icon system. Though similar interfaces had been attempted before, *Carrier Command*'s point-and-click aesthetic was comprehensive, and could be overwhelming at first. Initial experimentation uncovered technical printouts, repair systems, data on craft types, and even options for setting resource priorities. Interestingly, their distinctive look was something of a fluke. "At the time Realtime had no artist and Ian wrote a little routine called 'Choccyblock' to show what he thought the buttons should look like," relates Baird. "Then he promptly went on holiday. By the time he got back the icon system was pretty much in its final state, with me drawing a bunch of little icons to represent the function of each button. These icons were later tarted up by an external artist, although to be honest he didn't do that much to them."

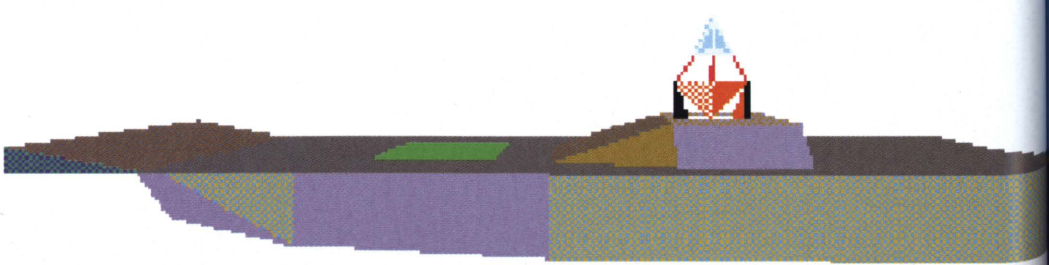
On the surface the AI in the game was robust, but Baird confesses that short cuts had to be made. "Let's face it, the processing power and memory limitations of the time just didn't let you be too clever," he admits. "We cheated anywhere and everywhere that we thought we could get away with it without compromising things too much." As for vehicle physics, Oliver is similarly unrepentant. "We didn't really have much – everything was faked, as real physics is expensive. Some things experienced gravity, some things bounced off each other, but for the most part we just coded up what worked and didn't care too much about reality." More seasoned



Carrier Command was an engineering triumph and an armchair strategist's dream. The goal was simple, but required meticulous planning

Carrier Command players will remember the bug on the first ST version which saw the enemy carrier carving its way through the islands from time to time.

But *Carrier Command*'s real beauty lay in its insistence on developing and nurturing an efficient supply network. Because the SS Epsilon could take up to ten minutes to reach each island, it was important to strike a good balance between creating defence islands, factory bases, and resource islands. Travelling back



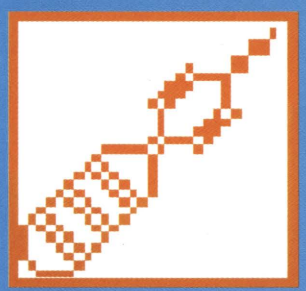
to defend a weak network of resource bases could consume valuable time. Finding the weakest link in your enemy's network was vital. Cut off his chain of supply and his fuel and weapons resources would quickly dry up.

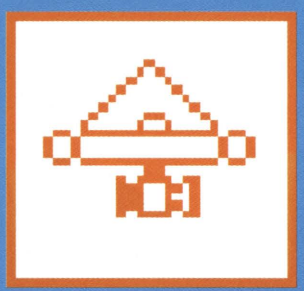
"Graeme coded all of the resource system using his background in roleplaying games and a lot of simulated 20-sided dice," jokes Oliver. "Quite how much of the complexity came out in the product I don't know, but behind the scenes it was important to run your campaign properly and defend your supply chain. Graeme also worked on the simulated battles for islands that happen if you don't have your carrier or a plane around to see them. These were tuned to try and match what would happen if the battle was being observed, and this tuning had to be good because you could suddenly arrive at a battle, so we'd have to try and mock up the stage it was at."

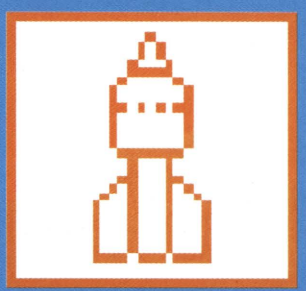
While complex battles were being simulated all around the map, the engine which kept everything in harmony within the player's ken remained relatively minimalist. "The game design was too big for the machine," continues Oliver. "We could have two islands active at one time, each with 64 objects on it, and we also had 64 objects in existence that were flying free of islands. Not only was that often a lot to render, but we also had to run the AI for all the objects, and, more importantly, had collisions to detect between all the objects. We worked together on the collision detection, which was handling some complex shapes, and ended up with it taking a negligible amount of time. I'm still not sure that anyone else is using the approach we came up with."

Carrier Command may have had one nasty bug (the carriers' tendency to sail across land, which was fixed on subsequent versions), but it still delivered easily the best resource strategy game of its time. However, coding the game took its toll on the small development team. "Technical nitty gritty aside, let's just say that the job nearly killed us and the stress level was very high," says Oliver. "The project was high-profile for Rainbird, and they had these things called budget periods that we didn't really understand. They used a mixture of promises, encouragement, and outright threats to get us to deliver, and despite the long gestation the project was undoubtedly rushed towards the end."

Coding the game took its toll on the team: "Let's just say that the job nearly killed us, and the stress level was very high"





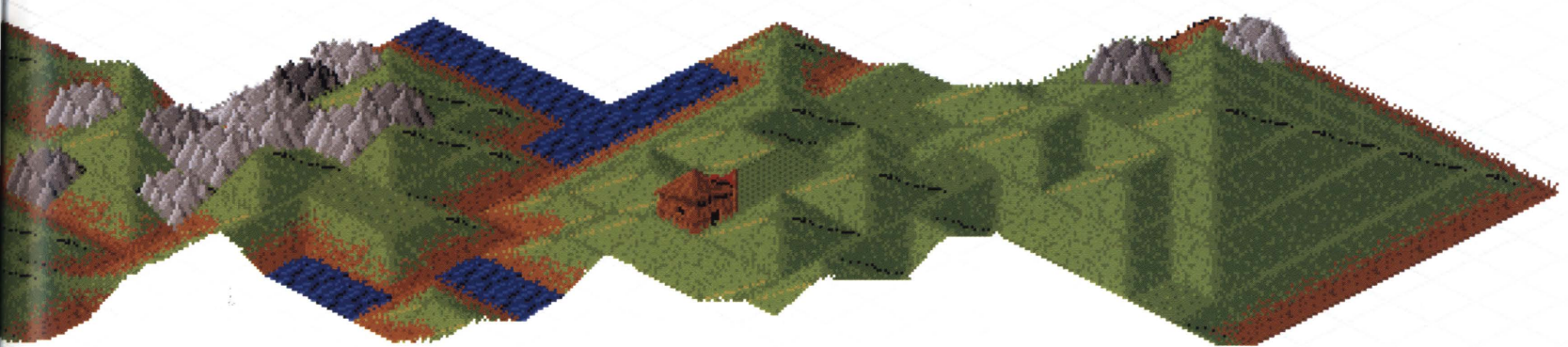


Oliver, Baird, and Onions (who coded the 8bit versions) certainly look back on Realtime with more fondness when they were knocking Spectrum games together out of a back bedroom in Leeds. Parties were held after their first hit, *Tank Duel*, made them a £20,000 profit, and again when the formidable *3D Starstrike* put £200,000 in their bank accounts. But the success of *Carrier Command* proved a different experience. "To be honest, I didn't really notice," laments Baird. "As soon as the first version was out of the door, and after a couple of days' sleep to recover, we were straight into doing the Amiga version and a second release of the ST version, so it all kind of passed me by." Oliver agrees: "They were pretty wild times, but in some ways *Carrier Command* represented a switch for us from programming for pleasure in an unbelievably casual environment, to doing it for gain with project plans and employees. And I really can't decide whether this was a good thing or not."

Populous

With precious little game development experience, tiny startup Bullfrog created not just a memorable game but, in essence, an entire genre. *Populous* discarded the established blueprint of 'direct control' between player and onscreen charges, marking a true generational leap for game design

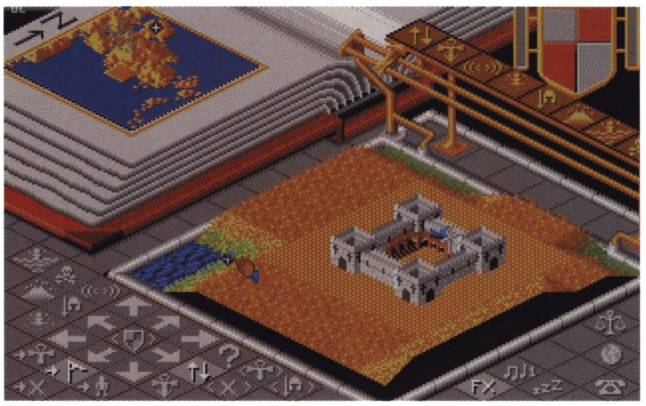
Original format: **Amiga**
Publisher: **Electronic Arts**
Developer: **Bullfrog**
Origin: **UK**
Release date: **March 1989**



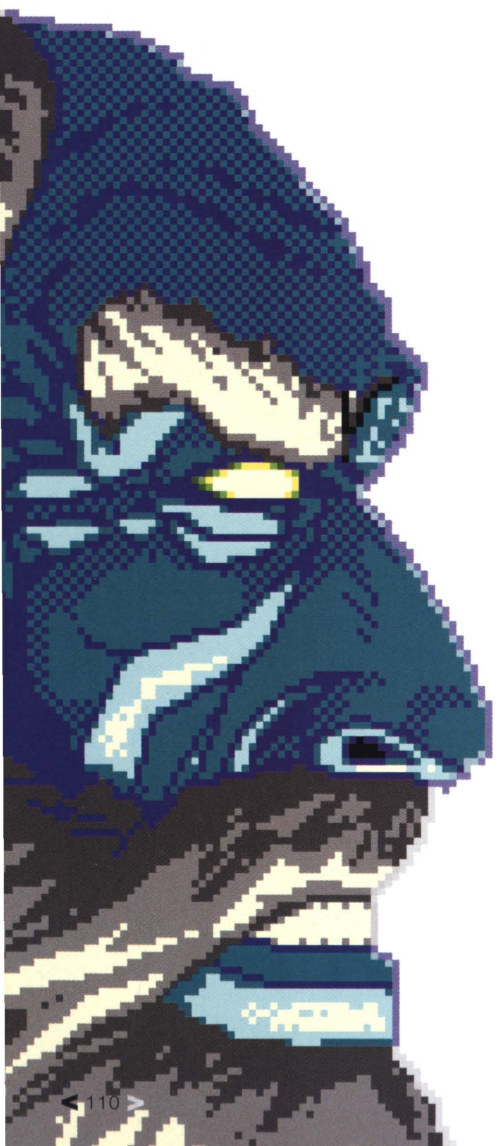
We insisted that we would only fly over if we could go first class – it seemed worth a try – but we were amazed when they agreed," recalls **Les Edgar**, co-founder of Bullfrog. "It seemed so opulent. I can remember Peter and I saying on the flight that we'd never in our lives be able to travel like that again. When we arrived in Japan, there were TV cameras at the airport – and, with no forewarning whatsoever, they were waiting for us. We just couldn't believe it."

Rewind through weeks, months, seasons, and the story of *Populous* begins with a simple misunderstanding. Commodore, fostering industry support for its fledgling Amiga during the mid-1980s, sought to contact Torus: a firm specialising in network solutions. An auspicious error led to an unexpected call for *Taurus*: a minor startup, barely founded, with a plan for a database program. Judicious use of language by **Peter Molyneux** during a subsequent visit to Commodore led to the not-inconsiderable bonus of free Amiga hardware for his tiny company.

More fortuity was to follow. Offered the opportunity to write an Amiga port of *Druid 2* for Telecomsoft, Molyneux bluffed his way into a princely £8,000 contract and hired **Glenn Corpes**, initially to fulfil an art role. "I didn't think I would be able to cut it as an artist for much longer, because of the higher standards required with new hardware," Corpes candidly admits – but he could also perform coding duties. This handy, incidental ability became a catalyst when, apropos of something or other – and, he says, inspired in part by *Spindizzy*'s screens of 8x8 isometric cells – Corpes created a 3D landscape with variable terrain levels. Edgar and Molyneux found this immediately



One occasionally overlooked facet of Bullfrog's momentous first game is its multiplayer support. That two players could link Amigas for one-on-one battles was a technical feat; the extra option for cross-platform combat – between ST and Amiga – was revolutionary



intriguing. With no end result in mind, no blueprint, but with palpable enthusiasm, they began to experiment.

"Over a week, we got a landscape you could move around," says Molyneux, "but we didn't really know what to do with it. I said, 'Let's put some little people on it.' Me being me, I think I actually said something like, 'Let's have a *thousand* little people run around on it.'"

Of course, key to *Populous* is the ability to alter the level of its terrain, and what was originally a novel trick soon became an integral gameplay element – but only after one issue was addressed. "All you could do at first was raise the landscape up and down," remembers Corpes. "This was going to be controlled with a joystick, but it was Peter who said we should use the mouse. It was a nasty bit of coding to coordinate landscape and mouse pointer."

"We were very primitive at that point," explains Molyneux. "It seemed a daunting task, although it seems laughably simple now. It was all a bit soulless, though. The next step was realising that it was pointless just having the people milling around, so why not let them have little houses? Little people would look for blank area of land, then build a house. The more houses, the more people, and the game evolved through that."

"We didn't talk about gods for a second – it really didn't occur to us. We said: let's have a red team, and a blue team, and they're both trying to expand to fill the most territory. The next thing we did was the most amazing revelation. We linked up machines with serial cable, which led to early multiplayer games. Multiplayer *Populous* came way before the singleplayer game. It was far more strategic and quicker than we thought it could be, flattening the landscape for your team. We even coined special terms for what we would do, like 'sprogging' and 'nippling'. There was still something lacking, though. The games we played took hours and hours – the only way to win was to stop the other person's people settling down."

"We got the multiplayer mode working from pretty much day one, and it was really good fun," agrees Corpes, who produced the distinctive 'book' border artwork within days of beginning work, "but games did last too long. We used to work on it until six, play it till ten, then go to the pub and talk about it for an hour."

With Molyneux and Corpes looking to add layers to their simple, engaging brief, Edgar attempted, for a worrying time in vain, to find a publisher. "We couldn't sell it to anyone," Edgar recalls with a laugh. "I even rang up Lego, and tried to explain the idea to them. They didn't like the good versus evil idea for some strange reason, so they weren't interested – which is funny, when you consider all the Lego sets with laser guns, cowboys and Indians, and so forth. We tried everybody. While [the team] were in the office, I went off with disks to, I suppose, over a dozen publishers – even the B-, C-, D- and E-list companies. We didn't go to EA even though we knew them through *Fusion* [an early, almost entirely forgotten Bullfrog shoot 'em up] because we honestly thought they wouldn't be interested. Eventually, we put it past Joss Ellis at EA and – to our amazement – he gave us the green light."

Glenn Corpes thinks that Ellis, having worked as producer on Geoff Crammond's *The Sentinel* earlier in his career, may have suggested *Populous*' (very similar) level progression system. He also remembers Molyneux suffering disastrous hard drive failure; with no back-up of his source code, Molyneux was forced to work tirelessly for three weeks to rewrite it. Without a discernible trace of schadenfreude, Corpes remarks that it was probably a blessing in disguise: the code was much better the second time around.

What would become known by many as 'God powers' were introduced as the missing gameplay device; flesh to the muscle and sinew of encouraging your miniature charges to be fruitful and multiply. "The first effect we put in was the volcano," reveals Molyneux. "We had this idea that a little power bar could grow when your people were inside their houses. That led to the introduction of earthquakes and swamps… but there was still one big problem. How could you finish a game more quickly? The last thing we added, and the solution, was the knight – the ability to combine the little people into one big soldier to go and fight."

Despite their obvious passion for their opus, Molyneux vividly remembers fearing the worst when the time came to show *Populous* to the outside world. "I can remember worrying, 'People are going to think this is completely weird.' We'd already seen that loads of publishers didn't get it and, as we had a comparatively bad deal with EA, we weren't really expecting any royalties. Without showing someone, or better still, letting them play *Populous*, we didn't really know how best to explain it. At no point during development did we talk

Those who bought the add-on pack for *Populous* have reason to feel at least *mildly* cheated: in terms of additional programming Molyneux merely (and cheekily) reversed the order of the random number 'seeds' used to generate landscapes. These were more innocent times

about you being a god, or it being a 'god game' – it just didn't occur to us. The person who suggested that was a journalist called **Bob Wade**. He was the first games journalist to come and see it."

Bob Wade worked on the popular multiformat videogame magazine 'ACE'. "It would be nice to think it was me, but I'm pretty sure it was the 'ACE' team as a whole that came up with 'god game.' I do remember the trip to see it, though. They were obviously not media savvy, and weren't used to having that sort of attention. Only afterwards did I realise how unprepared they were for it all. They were normal people, with a genuine passion for what they were doing. It was as much them asking what I thought of it as it was me asking them about how it worked. I remember Peter asking me what I thought of it while in the pub later that day and I didn't have any qualms about saying that it was bloody special, absolutely blinding, and it was going to be huge. I really wanted to go back and play it again."

"All I wanted to say was, 'What do you think?'" laughs Molyneux. "So we took him down the pub, drank god knows how many pints, plucked up the courage, and then asked him. And he really, genuinely, loved it. So I made the decision not to take him back to play it again, just in case he changed his mind."

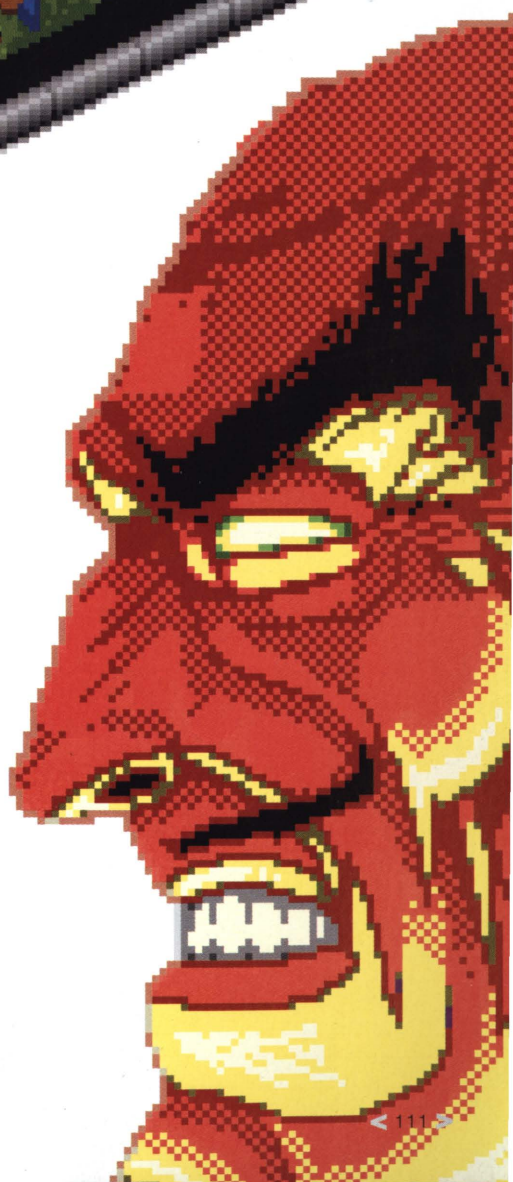
Critical approbation vindicated the team's desire to innovate – and *Populous* truly met with universal acclaim – but Bullfrog was impoverished. At the time, the codeshop was operating out of a room in an attic ("Our offices were shite, they were absolutely awful," shudders Molyneux) above a pensioner who would later attack senior Fujitsu staff with a mop when they attempted to pay a visit. "We were totally broke," Molyneux confides.

"Our royalty cheques were due to be paid one quarter in arrears, and we didn't expect to get any," Edgar recalls. "We really were very detached from the quantities sold – we had no idea how big it was. Our first cheque was for £13,000. We agreed to pay off bills, and then think about what to do next. The next cheque was for a quarter of a million. I thought it was a mistake at the time. I actually called EA to tell them. And then Imagineer made an absurdly huge offer for rights to develop it as one of the launch titles for the SNES in Japan."

Ah, yes. Japan. At the airport, Molyneux and Edgar were thoroughly nonplussed by their reception, and the events that followed. "It was massive over there," Molyneux says, with understatement. Western computer games just didn't, and still don't, evoke great fervour in Japan. "They had organised this big competition, with me playing against their national champion. They even played our respective anthems before we began. I hadn't played it in two months. I knew the cheats, though. I would have used them if I hadn't had all those bloody cameras watching my every move. [Laughs] He absolutely thrashed me."

Its successor added a popular full-screen option, but few criticised *Populous*' small play area. It's perhaps difficult to appreciate, with hindsight, just how truly revolutionary Corpes and Molyneux's engine seemed in 1989, although its icons took time to memorise

As a footnote, it's worth mentioning that Glenn Corpes claims that Molyneux nefariously tweaked aspects of the *Populous* code in order to beat him during their frequent multiplayer battles. Yeah, we don't doubt that for a second, Glenn.



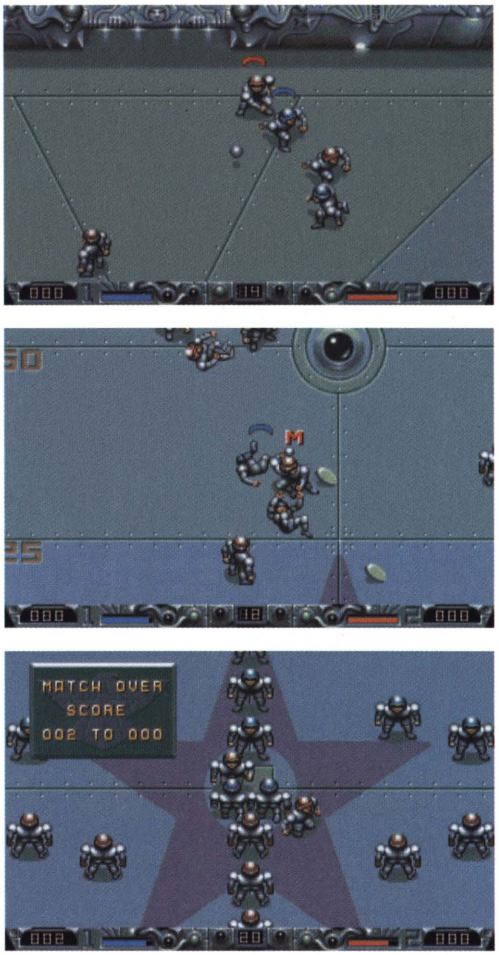
Speedball 2: Brutal Deluxe

Many tried. Most failed. For The Bitmap Brothers, however, producing a convincing and compelling future sports experience was a goal they achieved

Original format: **Amiga**
Publisher: **Mirrorsoft**
Developer: **The Bitmap Brothers**
Origin: **UK**
Release date: **November 1990**

To this day, just over 12 years after its launch, *Speedball 2: Brutal Deluxe* abides as the definitive future sports videogame. That it can also be described as one of the finest sequels ever crafted makes it, not its predecessor, worthy of inclusion here. However, while the original *Speedball* clearly inspired it, both games owe their existence to a moment of pure serendipity. In a pub near Liverpool Street Station, London, in early 1988, the Bitmaps reflected the cancellation of one project… and left with the outline of their most successful series to date.

"After we'd finished *Xenon* for Mastertronic, they asked us to do a game based on Real Tennis," recalls Bitmap Brothers MD, **Mike Montgomery**. "We did a lot of research – [*Speedball 2* designer] Eric Matthews even went to Hampton Court, and the Real Tennis court there, and stuff like that – went back to Mastertronic, and they said: "Oh, we don't want it now." We were a bit disillusioned, so we went to the pub. We got thinking: why not do a sports game, but with no rules, using some of the ideas from Real Tennis? So we designed the whole thing – what became *Speedball* – on the back of a fag packet [laughs]. It was the only piece of paper we had – a Silk Cut packet, actually. And when we actually thought about it, it wasn't anything like Real Tennis at



***Speedball 2* had improved audio (the ice-cream vendor's cries will surely always be remembered) and, more importantly, updated visuals: the larger pitch was able to scroll in eight directions**

all. We went back to Mastertronic, and they weren't interested, so we went to Mirrorsoft, and they said: "Wow! We like this idea. Do it now!" So we signed up with them."

Although obviously a brilliant game in its own right, *Speedball*'s most important achievement, at least for the purposes of this article, was its role as a catalyst for its successor. The critical and commercial success it met with made a sequel desirable; a core team consisting of Eric Matthews (lead design), **Robert Trevellyan** (coding) and **Dan Malone** (art) was assembled to create it, although Mike Montgomery, Steve Kelly and Graeme Boxall would also contribute a great deal. Two key members of this group were making their Bitmaps debut. "*Speedball 2* was my first published product," Rob Trevellyan tells **Edge**. The other new recruit – although backed by years of industry experience – was artist Dan Malone. "I went along for the interview, took my portfolio along on the off chance, and they said they had a game coming up," he recalls. "It was *Speedball 2*, and I went straight on to it."

Speaking to key protagonists, **Edge** notes repeated comments to the effect that the team, and therefore Speedball 2, 'clicked'. This is underlined by how painless the design process appears to have been. "If I can remember rightly, I think we designed most of the features at the beginning, and I don't think we ever changed anything – because they all worked, and we'd put a lot of thought into them," says Montgomery. "It's like with the pitch features: we could have chosen all sorts of things, but having only a few really worked. One of the strongest things about *Speedball 2* was its simplicity. The pitch features don't change from game to game. It's only 90 seconds a half, so you really don't want to be having to learn a new layout each time: you want to play the game."

The foremost strength of *Brutal Deluxe* – a suffix chosen, Malone reveals, after repeated listening of 'This Brutal House' by Nitro Deluxe – was its fast and furious nature, but the addition of arena furniture and new ways in which to score allowed and encouraged strategic individuality during play. "Well, that's what we tried to do – to make it more of a tactical game, where goals mattered, but there were other ways of scoring," says Montgomery. "You could use the pitch features to your advantage in a number of ways, like electrifying the ball, bouncing it off the keeper to knock him down, then scoring. We actually got most of the inspiration for the pitch features from playing pinball."

Another important enhancement was its increased play area. "I'd say *SB2*'s most significant technical advance over the original was the eight-way scrolling pitch," contributes Trevellyan. "In the first version the pitch was only as wide as the screen and only scrolled vertically. *SB2*'s pitch was significantly larger and scrolled in eight directions."

Bitmap Brothers games of the late '80s and early '90s were typified by their technical prowess; sensory excellence was the devco's

"We designed the whole thing – what became *Speedball* – on the back of a Silk Cut packet in the pub. It was the only piece of paper we had"

Fatal Justice versus Turbo Hammers: it's like something out of 'Robot Wars'. Nevertheless, the game built an atmosphere unmatched by any other in the genre – in fact it'd be fair to say that no other title has created such a convincing vision of a fantasy future sport

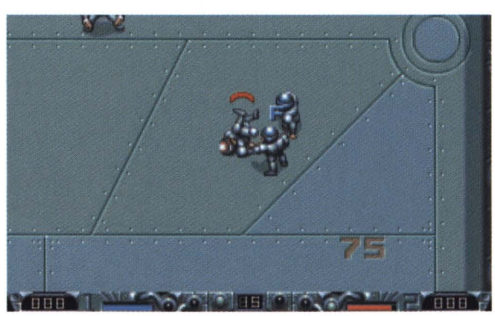
trademark. Even by these high standards, though, *Speedball 2* was marvellously slick and stylish, with Malone's visuals being especially memorable. "I based it all on *Speedball*, obviously, but I just streamlined it down, really, and simplified certain things," the artist explains. "I pictured a gladiatorial arena, but with a sporty edge; things like the knee pads on the players are a skateboard influence, as I wanted it to have a reasonably contemporary feel. It was quite freestyle: there was no one individual influence. I had a free reign on the game, so for me it was fantastic to be able to flex the old mouse hand. We all knew roughly what we wanted, and it happened. Looking back, it's actually my favourite game to have worked on, because of the smooth flow of the ideas. It wasn't all: We can't do this, and we can't do that. It all just clicked into place." Not *every* element of *Speedball 2*'s creation ran smoothly, however – at least, not initially. "I think the biggest thing was getting the frame rate as high as possible, which meant we needed some very clever coding," explains Montgomery. "I think we spent more time tweaking the speed of it, programming-wise, than we did with anything else."

Trevellyan explains: "I can say we were always up against it in terms of frame rate, especially on the Atari ST. We used various techniques to keep things running at 25fps as much as possible. Triple buffering was used on the ST, along with various special-case optimised sprite rendering routines. Also the pitch background was very simple to allow the use of some tricks for high-speed background updates. On the Amiga a damage map was used to ensure that only areas of the screen that needed redrawing were touched. The more sophisticated display hardware allowed us to use a more detailed pitch, but maintain the same frame rate."

With its singleplayer mode imbued with greater depth in the form of a league mode and the option to acquire and train new players, *Speedball 2* was a genuinely 'complete' sequel. It was its multiplayer mode, however – in keeping with its predecessor – that made it truly exemplary. The Bitmaps knew this: like every development team in scintillating form, there's a case for describing them as their own best customers. "We broke *hundreds* of joysticks while testing it, to the extent that we got sponsored by a joystick manufacturer, Euromax," laughs Montgomery. "They sent us boxes and boxes of the things, those little black triangle ones."

"It's one of the few games I did play," chuckles Malone. "It was very competitive. I can remember the number of broken joysticks – we really used to get through them." Trevellyan completes a trinity of hardware carnage anecdotes: "We wore out a lot of joysticks. Most joysticks weren't up to the job of playing the game for very long." How many digital switches were damaged or destroyed, worldwide, by *Speedball 2* play? An enormous but sadly unrecorded amount, it's fair to say: *Brutal Deluxe* far outstripped its conceptual sire (no commercial slouch itself) at retail. "Oh, it was much, *much* bigger," says Montgomery. "I think we did over a million units, over all the formats. It even sold well in Japan – it's our biggest-ever hit over there. We were always extremely confident in the game. When the journalists first saw it, there was a real buzz, and we won no end of awards. It's strange to think that it took us nine months – nine months! – and we had such good fun doing it…"

One question remains unanswered: why on *earth* did Mastertronic, even fleetingly, ever want to commission a game based on Real Tennis?



Having previously worked on the likes of *Sacred Armour Of Antiriad* for Palace Software, artist Dan Malone joined The Bitmap Brothers just as it was about to begin *Speedball 2*. It was a marriage made in heaven, his inspired metallics fitting perfectly


Shivers me timbers just looking at it.

The Secret Of Monkey Island

Pirates, trials, puzzles you could actually solve, genuinely amusing gags: what didn't this point-'n'-click adventure have? Edge talks to the game's creator about humour, SCUMM, and George Lucas's love of baseball

Original format: **PC**
Publisher: **LucasFilm Games**
Developer: **In-house**
Origin: **US**
Release date: **1990**

The Secret Of Monkey Island is widely renowned as the finest point-'n'-click adventure ever. While you could argue that *Sam And Max Hit The Road* is funnier, that *Day Of The Tentacle* is more aesthetically pleasing, or *The Fate Of Atlantis* more cleverly scripted, on aggregate *The Secret Of Monkey Island* has enough of every relevant desirable attribute to make it the most memorable and accomplished graphic adventure of its era.

Between 1987 and 1993 LucasFilm Games (known as LucasArts from 1991) dominated the genre to a remarkable extent; each release, including sequels, having a richly distinct style.

"I started at LucasFilm Limited doing ports to the Commodore 64," recalls *Monkey Island* creator **Ron Gilbert**. "When I finished my porting work, I did a game design with an artist at LFL – Gary Winnick – called *Maniac Mansion*. I had always loved adventure games, and was particularly fascinated with *Kings Quest*. I had a real love/hate relationship with that game. I loved the concept of an animated adventure, but was really frustrated by the puzzles, so I set out to make *Maniac Mansion*."

Maniac Mansion was revolutionary in a number of respects. Foremost amongst these was its use of the Gilbert-created SCUMM ('Script Creation Utility for *Maniac Mansion*') engine. This high-level programming language not just facilitated, but also simplified the process of directing bitmap characters and objects within any given scene. In a progressively modified form, it has been used in every successive LucasArts adventure. Gilbert is reluctant to be drawn into a discussion on its intricacies, though: "I can't really say anything about SCUMM. If I do, George Lucas will come over to my house and bust the place up with a baseball bat." On the subject of *Maniac Mansion*'s other key innovations – the considered absence of manifold 'sudden' deaths, a genre idiosyncrasy since early text-based games, and the thoughtful omission of completely inexplicable puzzles – he's equally, though understandably, recalcitrant. "Oh, man," he groans. "There isn't enough room in the whole friggin' magazine to fully rant about death in adventure games..."

Zak McCracken And The Alien Mindbenders followed *Maniac Mansion*, and Gilbert began to consider another project. It's hard to imagine the embryonic *The Secret Of Monkey Island* surviving in many – if any – modern codeshops, but LucasFilm Games was enthusiastic from the start. "Back when I made the first *Monkey Island*," he remembers, "there was no 'management', so to speak. It was just a bunch of people that loved games. The head of the games division was Steve Arnold, and he was very good at letting creative people be creative people." Just as Gilbert began to work seriously on his embryonic design, however, his talents were appropriated for use elsewhere: LucasFilm wanted a game to tie in with the release of 'Indiana Jones And The Last Crusade'. *Monkey Island* was put on hold while he rushed to finish the first Indy adventure before its big-screen equivalent made its debut.

With the benefit of hindsight, this delay may have been highly fortuitous.

My name's Guybrush Threepwood and I want to be a pirate!
NONE SHALL PASS!!
Captain Smirk's Big Body Pirate Gym
Soon you'll be wearing my sword like a shish kebab!
IMPORTANT NOTICE
These dogs are not dead, they are only SLEEPING.
No animals were harmed during the production of this game.
I really wish I knew how to talk to women.
I have a feeling I'm going to regret this, but count me in.
There's some VERY fine wine in here.
Holy Monkey Bladders!
THAT should do it.
It's that eerie-looking ghost ship I saw sailing off with the Governor!
...let's not be hasty.
I hope now you've learned to stop picking your nose.
My, what an unusually bright yellow they are.
The Legendary Lost Treasure of Melee Island
Hey, Rick, I just committed a felony!
Hey, great, a drink!
"Davey Jones" Lockers
Through the courageous leadership of Captain Frep -er- Threepwood, the Sea Monkey is finally underway.
I never get tired of this view.
I had a feeling that in hell there would be mushrooms.
Yikes! I hate rats!
I don't want to wake him up unless I have some of that anti-ghost potion to defend myself with.
You scared me half to death!
Oh, there you are!
Never pay more than 20 bucks for a computer game.
Turn your computer off and go to sleep!

Despite his publicised contempt for old-school adventures with arbitrary 'deaths', Gilbert could not resist this gag – one that few players found at first

"I can't really say anything about SCUMM. If I do, George Lucas will come to my house and bust the place up with a baseball bat"

With the additional experience of working on a high-profile movie tie-in, Gilbert began the careful planning for *Monkey Island*. He began by writing short stories, showing those of sufficiently high quality to his colleagues. An idea that aroused the curiosity of many was the introduction of ghosts in one tale; from this, the ghost pirate LeChuck was brought in to existence. Central character Guybrush took a little longer to evolve into his final form. "I didn't have a name for the main character when we started pre-production," says Gilbert. "The original design for *Monkey Island* had the central character suffering from amnesia, so he didn't know his name. I dropped this story element, but then had to come up with a name. Steve Purcell (the guy who invented Sam and Max) was drawing characters for me to look at. He was doing the editing in *DPaint*, and when you pick up an object, they call it a 'brush'. Since we didn't have a name, we were just calling him 'the guy'. Steve kept saving his brush files as guybrush.lbm. It kind of stuck."

Straying from the path

One important aspect of *Monkey Island*'s appeal is the non-linear structure of its opening chapter, and Gilbert felt that wrestling with the complex logistics this introduced was worthwhile. The Three Trials plot device allowed him to offer a trio of separate tasks to the player. This meant that the entire game would not grind to a halt if the solution to a single puzzle was not immediately apparent. Having the SCUMM system in place also enabled him to fine tune areas of the game before committing to a final draft. Within three months of production commencing, Gilbert had a 'rough cut' of *Monkey Island*. Much of its art was an approximation of its final appearance, with no real animation, but it enabled him and co-writers Tim Schafer (later to create *Full Throttle* and *Grim Fandango*) and Dave Grossman (subsequently responsible for *Day Of The Tentacle*) to get a feel for their ideas in action.

Many games have their constituent elements bolted together for the first time at practically the end of the development process. Because *The Secret Of Monkey Island* was effectively 'playable' at such an early point, Gilbert was afforded the luxury of being able to polish the title's puzzle logic and plot from an early point – and, as aficionados with a game design background will assure you, this shines through in the game proper. Certain features did not bear the close scrutiny of play at this stage; elements were introduced and removed as Gilbert, Schafer, and Grossman tried to second guess the reactions of most players. *Monkey Island* fans may be interested to learn, for example, that Meathook initially required Guybrush to complete three tasks before agreeing to join the crew bound for *Monkey Island*, but the team worried that this had an adverse effect on the flow of that section – so two were removed. Conversely, the character of Herman Toothrot was introduced when Gilbert realised that the Monkey Island chapter felt rather slow. Being almost entirely unpopulated on the surface, bar the cannibals to the north, Toothrot introduced much-needed character interaction.

The Secret Of Monkey Island's unique aesthetic, created by artists Steve Purcell and Steve Ferrari, represents a highly creative compromise. "We had huge limitations – 320x200, with 16 colours," explains Gilbert, "so we chose a style that played off of that. I based a lot of the look on the Disneyland ride Pirates Of The Caribbean. I wanted you to feel like you were in that world." The relative simplicity of *Monkey Island*'s appearance gives it, perversely, an integrity that its larger and more lavish later counterparts, including its first sequel, lack. It's a fault of many graphic adventures that there are interesting pieces of scenery that aren't interactive, even when plausibly relevant for the purposes of a puzzle; similarly, sweeping the screen for objects with the mouse pointer was never an issue with *Monkey Island*, because its blocky style made its items distinct.

The gift of laughter

Being a comedy game, *Monkey Island* enabled Gilbert and his team to offer offbeat, although eminently solvable, puzzles. "Comedy makes everything easier in adventure games," reveals Gilbert. "If you really look at adventure games, they are pretty stupid. Nothing really makes sense. Why is it that I need a pencil to solve a puzzle, and the only one in the world is back in New York City, huh? So, if you can make fun of situations like that, it makes your life easier. I really can't think of any good graphic adventures that were not comedies." One set piece in *The Secret Of Money Island*, in particular, is a great example of how enjoyable comedy-tinged puzzles can be. Guybrush is lashed to a heavy metal idol that he attempted to steal in a botched burglary and is thrown into the sea by LeChuck. Around him on the seabed, in an almost perfect circle, lie a multitude of cutting implements – all just out of his rope-restricted reach. The solution is worth a snigger – as is, for that matter, an incidental moment when two men appear on the docks directly above and discuss the disposal of a murder weapon. It's a knife. "I liked that puzzle," admits Gilbert. "The solution was simple, but I purposely put people in the wrong frame of mind, so many players didn't get it. As a designer, that is a very satisfying thing. Confusing people is not satisfying, because that's easy, but putting the answer right in front of them and then doing a little 'puzzle misdirection' is fun. It's like being a magician."

Getting stuck in

Akin to many notable pieces of videogame creativity, *Monkey Island* was late – and as a result members of the dev team, along with other LucasFilm staff, were asked to help assemble thousands of boxed copies in order to ship on time. Many gamers in America, unbeknownst to them, may have a code protection wheel assembled by Grossman, or an instruction manual creased by Schafer. Despite such a hitch, the team was confident of its work's merits. "I was excited," confesses Gilbert. "I was very happy with the game. There was no publicly available Internet back in the olden days, but there was CompuServe. I remember going on to the gamer forum every day to see if anyone had played it."

Of course, *The Secret Of Monkey Island* was an enormous success on all fronts. It was followed in 1991 by a sequel, *Monkey Island 2: LeChuck's Revenge*. Larger and noticeably darker than its forebear – although not excessively so – it met with similar acclaim. At this point, and despite his intention to make a trilogy, Gilbert left LucasArts (as it had become) to found his own company. His only input into the last two *Monkey Island* games – both full of solid dialogue and immaculately produced, but lacking the je ne sais quoi of old – has been the inspiration inherent in his first two superb instalments. "I thought that *Monkey Island 3* was pretty good," offers Gilbert. "I liked the writing a lot. There were some story issues that I did not like. Elaine would never, ever, never, never, ever fall in love with Guybrush. I have not played *Monkey Island 4*."

So does he regret not working on a third episode, especially given the massive following that his first two games still command? "Yes, *Monkey Island* was planned as a trilogy," Gilbert laments. "It was very hard to leave after only two, but I really wanted to start my own company, Humongous Entertainment. I'm sorry to say that I can't divulge my story for the third *Monkey Island*. I have this fantasy that some day LucasArts will sell me *Monkey Island*, and I'll do the 'true' *Monkey Island 3*. People will play it and the Internet will be alive with buzz, saying things like: 'That was stupid!', and 'I like the other *Monkey Island 3* better'. Ah, you gotta love the Internet."

Sid Meier's Civilization

Judiciously influenced, a pioneering, influential classic in turn, *Civilization* is one of the most important PC releases of all time. **Edge** speaks to its creator, industry legend Sid Meier

Civilization is the most celebrated, successful and immaculately designed turn-based strategy title ever conceived – and yet, had designer and industry legend Sid Meier not trusted his instincts, it might have been a very different game indeed. "The original *Civ* prototype we put together was actually a realtime game," Meier reveals – and this piece of incidental development trivia is, for once, a genuine surprise. "The original was much more along the lines of a *Sim City*, where you could 'zone' areas – you had a big map, and you'd designate an area for a city, another for agriculture, and then sit back – kind of a *Sim City* taken up a notch in terms of scale. But what I found was that you spent a lot of time watching, and not a lot of time playing, so we stopped work for a while."

Original format: **PC**
Manufacturer: **Microprose**
Developer: **In-house**
Origin: **US**
Release date: **1991**

Many gamers still cite *Civilization* as the best PC title ever made. Like many great games, though, its creators did not know what they were making at the beginning

A similar hiatus for a contemporary project would almost certainly lead to its demise, but Meier and assistant Bruce Shelley – now of Ensemble Studios – were genuinely fascinated by the scope of the embryonic *Civilization* brief. "It appealed to us as a topic we thought was interesting, but also because it was 'big'," recalls Meier. "We were thinking: 'What else can we do with this whole computer game idea? Could it tackle something as big as history itself?' Most games at the time were about flying airplanes or suchlike – cool games, but they hadn't tackled a subject this large. That was a challenge for us, to take a topic as grand as the history of civilization and see what we could do with it."

The Microprose management had reservations, but Meier's growing reputation – cemented by the likes of *Pirates!* and *Railroad Tycoon*, among others – allowed him to return to *Civilization*. "They were okay," he laughs. "What they really wanted was another flight simulator, but I had by this point the flexibility to choose topics. In those days, 'strategy' was a dirty word – when you said it, people assumed you meant a slow-moving wargame with hexes, complicated rules... something only for the hardcore gamer. But *Railroad Tycoon* had been a modest success, and that gave us the freedom to put together this new design."

Darkness and history

Knowledgeable gamers often cite the Avalon Hill board game of the same name as the influence behind *Civilization*, but Meier also credits Will Wright's *Sim City* and classic wargame *Empire* as primary inspirations. It was from the latter that the concept of the game map being shrouded in darkness until explored was appropriated. Defining moments in history, too, lent a natural shape to certain features and underlying concepts. For true insight into why it became a classic, though, it's probably more important to understand not why it was developed, but *how*. It was the process of prototyping – either impractical or, worse, overlooked by many modern dev teams – that would bless *Civilization* with its exquisite, rarely paralleled 'balance'.

"The programming and the design were very closely tied together," explains Meier. "We'd have an idea, put it in, and the next day we'd play it, change it, or take it out. The technical programming of it wasn't hard, but what was interesting from a programming point of view was implementing design ideas in a way that they didn't unbalance the game. We had an expression: we wanted the player to play the game, and not the game to play the player – that the level of complexity wouldn't leave them behind. The systems in the game are interesting and quite accurate, but they don't overwhelm players. They're designed to work in conjunction with each other. You can easily understand the economic impact of a military decision, and the political fallout from an economic decision. You're managing

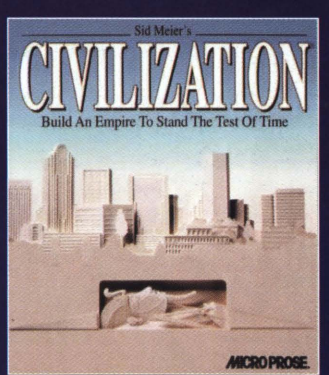
"We were thinking: 'What else can we do with this whole computer game idea? Could it tackle something as big as history itself?' Most games at the time were flight sims and suchlike – cool games, but they hadn't tackled a subject this large"

the whole civilization, not trying to understand it."

Constant experimentation was almost certainly the main reason for *Civilization's* at-best functional aesthetics – an astute trade-off, as it happened. "There's probably a limited amount of energy we have to put into a game," posits Meier, "and I think we chose wisely in where we chose to put that energy and creativity. In order to have a design process where we could constantly alter things, we couldn't really ask the artists to perfect something, and then ask them a week later to throw it out. We kind of worked with graphics that were very functional and clear, we hope, but not the most beautiful, because it allowed us a game design process where we could change things very quickly. We could ask an artist to draw a new unit, and have it the next day, as opposed to three weeks of 3D rendering later. It really allowed us to explore possibilities, to come up with some of the best features of the game – we could test, not just decide something, and then hand it over to a group of people to carry it out."

Drip feeding

While ostensibly very different, the underlying appeal of *Civilization* is tangibly akin to that of Nintendo's *Metroid* and *Zelda* games. One of the most laudable features of those titles is the manner in which they drip-feed new abilities to engender constant anticipation in the player. A sealed area in the *Link to the Past* game world, for example, is not a source of frustration – it's a tantalising future opportunity, once the appropriate tool becomes available. There's never really a 'right' time to turn the console off because, effectively, progress begets progress. The



Sid Meier's reputation is now such that it always appears as an official part of the game name, from packaging onwards

Best described as functional, *Civ*'s graphics conceal a gameplay beauty that very rapidly becomes evident once you get into it

outstanding layered structure of *Civilization*, similarly, means that there is never a point where the player isn't on the verge of achieving a goal, be it the completion of a 'wonder', the introduction of a new technology, or the conclusion of a military campaign.

"I'd like to claim that we figured that all out from the beginning," admits Meier with candour, "but I think a good portion of that naturally occurred because of the topic we were dealing with. I do think we were able to take good advantage of it. The technology tree, for example, seemed like something that had to be in there, but once we put it in, we realised it gave the game a quality of starting really small and simple, and gradually opening up all these other possibilities in a way that felt totally natural – it was just the way that history works, but from a game design point of view, was a great feature to have in there. People have talked about the one-more-turn phenomenon, that they just couldn't stop playing, and that was because there was always something to look forward to, always something just over the horizon that you could plan for."

"I think we were, at times, overly ambitious," Meier recalls. "We had to scale back certain things, like the size of the map – it was originally four times as big as it was in end, and it was pretty unmanageable. With a topic like that of *Civilization*, it's more what you don't put into the game than what you do, because there are so many possibilities."

Given Microprose supremo 'Wild' Bill Stealey's preference for another (back then, eminently bankable) flight sim, not a grand but untested project like *Civilization*, it would be perfectly understandable had its team worried when initial sales were quite low. "In those days, a strategy game called *Civilization* sounded really scary," Meier chuckles. "People thought: 'Oh boy, *this* is going to be hard work.' At first, sales were a trickle. But we knew we had a fun game because we couldn't stop playing it when we were developing it. We felt good about it – we didn't panic."

Glowing reviews and, significantly, word of mouth eventually helped *Civilization* on its way to becoming a huge, deserved hit. "The pattern is usually a game sells very well in its first month, then trails off," Meier explains. "We saw the reverse – it sold modestly in its first month, then picked up during the second and third. It did very well – I think it eventually sold over a million copies, so it was very good for Microprose."

"And I can't complain, either," adds Meier with a hearty laugh. "Of all the games I've worked on, I'm probably most happy with *Civilization*. What it has really done is allow me to be pretty flexible in terms of the games I do. I always like to do something different, and publishers aren't always totally receptive to that. But like Will Wright can with *Sim City*, I can point at *Civilization* and say, 'Well, when I first came up with that, you didn't think it was a good idea, but it did pretty well, *so*…'"

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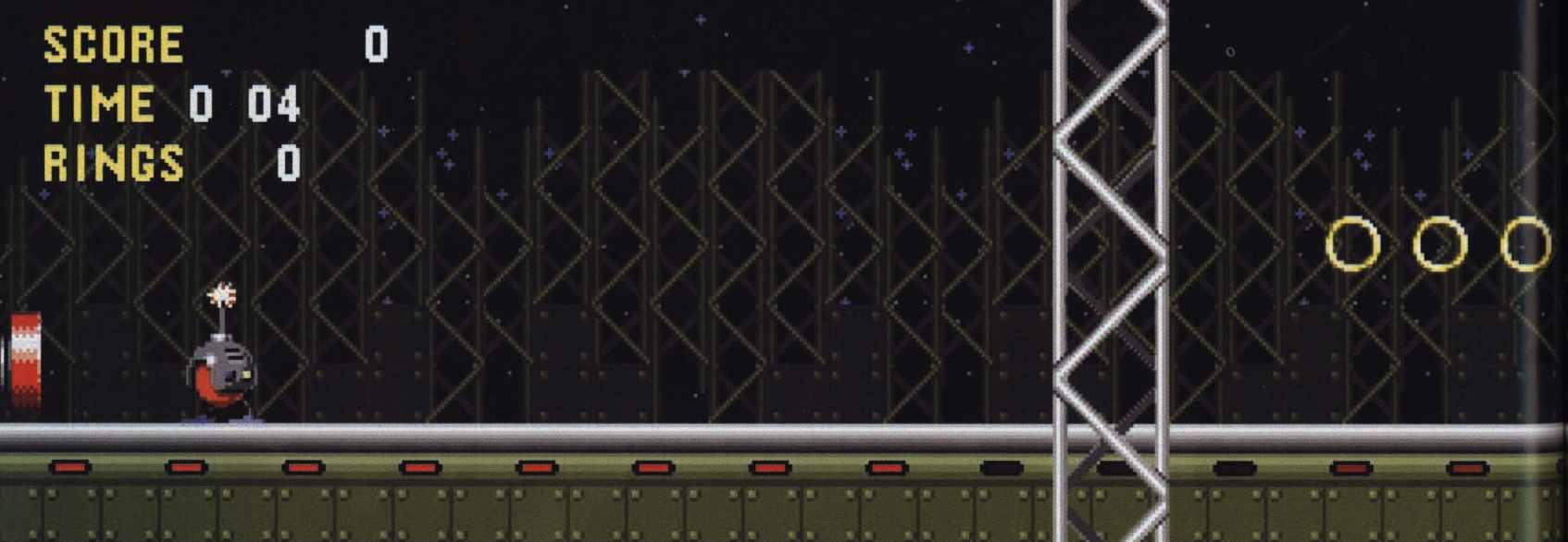
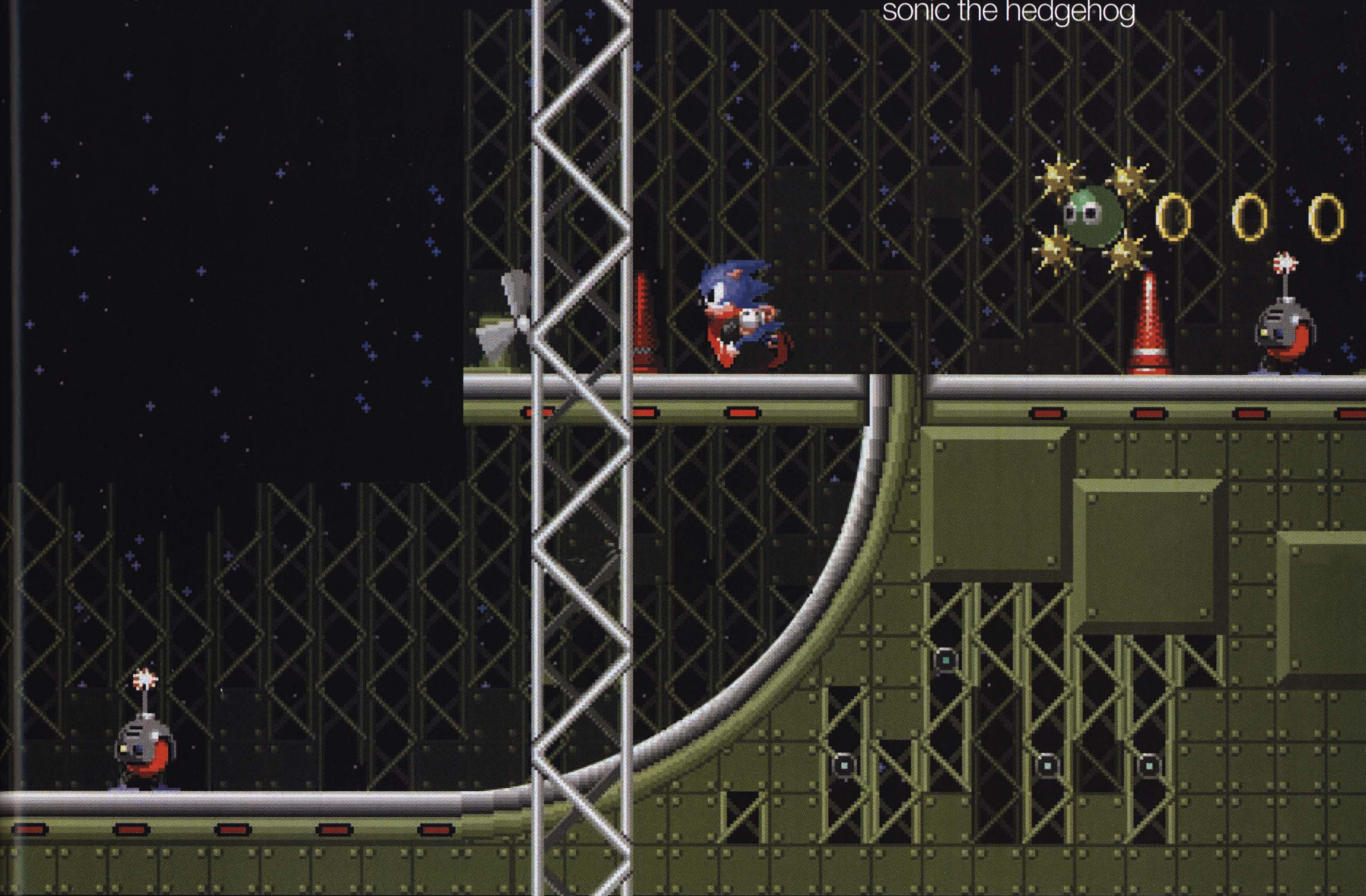
Sonic The Hedgehog

Sonic has been a lot of things over the years: a cartoon, a Swatch watch, a McDonald's Happy Meal gift, pasta shapes, boxer shorts, even a gene. He's conquered the skies as a hot air balloon and travelled the F1 circuits at up to 200mph. **Edge** discusses his genesis with Sonic Team's Yuji Naka

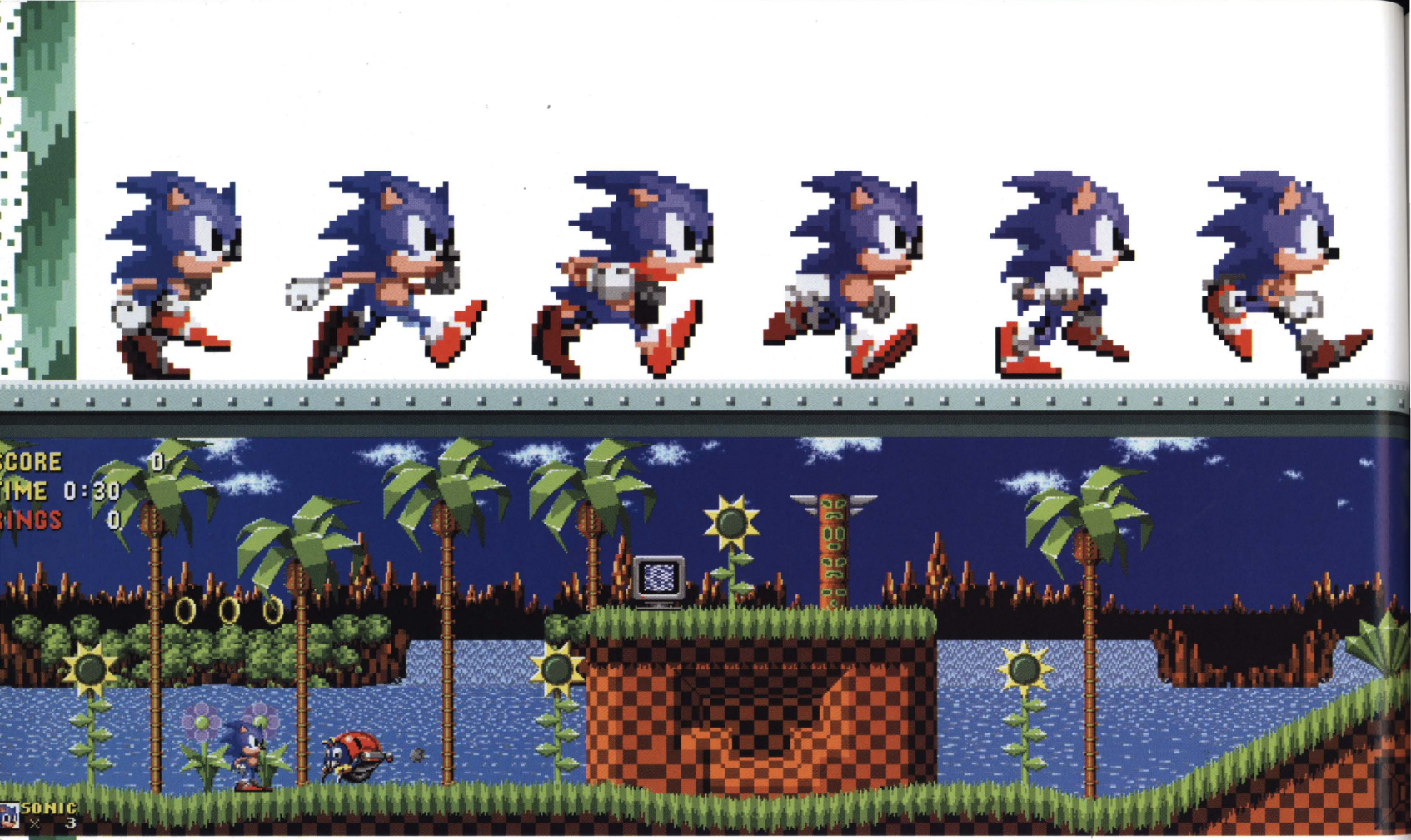


Original format: **Mega Drive**
Publisher: **Sega**
Developer: **Sonic Team**
Origin: **Japan**
Release date: **1991**



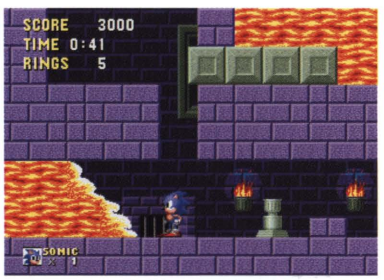
The game may be ten years old, but *Sonic The Hedgehog* hasn't aged. It's one of those rare 16bit titles – one whose aesthetic manner is so stylised that it easily manages the impressive feat of still looking good today.

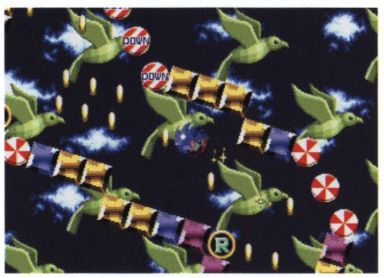
But back in 1990, things didn't look as attractive for Sega. With the Mega Drive sitting in considerably fewer living rooms than the company had hoped, Sega's plans to relax Nintendo's stranglehold on the industry looked remarkably unconvincing. Nintendo had Mario. Sega didn't. Fearing another Master System debacle, the race was on to come up with the 16bit system's killer app featuring a character that would emerge as Sega's mascot, just as the squat Italian plumber had done for Nintendo. An internal challenge was laid down, and after toying around with rabbits, kangaroos, pandas and other furry equivalents (partly based on an initial premise that the



Green Hill (above) still retains a magical quality (and is also in *Sonic Adventure 2*). The 'technically impossible' rotating bonus round (right, centre)

"I really thought the game would be a hit – it had the potential. But I would not have thought for a single minute that it would be so successful"





character in question should, above anything else, be able to jump), the company focused on two contenders – an armadillo and a hedgehog – before dismissing the former in favour of artist Masato Oshima's sketch of a blue spiky Erinaceus (presumably) europaeus. It helped that Sega also liked the way the word 'hedgehog' sounded in English. It was then up to **Yuji Naka** and his team to come up with the goods.

Naka-san had grown up playing Shigeru Miyamoto's games. He understood the need for simplicity of control amid what could often develop into a chaotic environment for a game character – the ability to make matters as intuitive as possible did not escape him. Hence the decision that Sonic would only require the D-pad and a button to move around the screen was a swift one. And Sonic himself was no slouch, either, of course.

"I thought about a game which would differ from *Mario* with a great action flavour," Naka-san says of the hedgehog's pace before going on to cite the ability to traverse hilly stages at high speed as the game's main

technical achievement. But in terms of development, the team had bigger mounds to climb.

"I wanted Sonic to be able to offer a good balance between technology and gameplay," divulges Naka-san. "So I had to think of the character in this light, and we proceeded with technology test and gameplay design. That cost lots of time, more than half a year.

"In order to exploit the hardware's power we had to try many things, many tricks. We were very passionate about showing what the machine was capable of. Maybe it's because I was programming myself, but I was also interested in seeing what the other programmers would be able to do with the hardware. Sonic was delivering [the kind of] high speed no other [game] was capable of, and the Mega Drive allowed this stunning demonstration of rotation during the bonus stages. This was said to be impossible on the hardware at the time."

But *Sonic The Hedgehog* was more than a seemingly unattainable technical achievement. Released on June 23, 1991, it represented a sweepingly absorbing prospect, full of quirky aspects and hugely popular innovative touches.

"I really thought the game would be a hit – it had the potential," recalls Naka-san. "But I would not have thought for a single minute it would be so successful. I think this success is one of the reasons Sega became a major player."

Indeed. The decision by Sega of America to bundle the game with the Genesis (replacing the nonsense that was *Altered Beast* – early Genesis adopters were even offered the chance to send off for a free copy of Sonic to ensure fairness) kickstarted the company's comprehensive assault on the US videogame market, which Sega would subsequently go on to dominate. After some four million units were purchased, and to the delight of its parent company, the inevitable happened: Sonic evolved beyond the boundaries of its gaming origin, becoming a marketing team's dream. The little spiky blue creature with the big red trainers became a household name, with children the world over badgering their parents to buy them the latest Sonic merchandise.

Since 1991, some 29 *Sonic*-related titles have been released across a variety of formats (including Mega Drive, Game Gear, Mega CD, Pico, 32X, coin-op, Saturn, PC, and DC)

"I have been greatly pleased by the letters and emails I've received from fans. Particularly, I have been very happy with great drawings I've received from children overseas. The drawings feature new character ideas for future *Sonic* [games], and there were these mentions saying that I have the permission to use these characters," reveals the Sonic Team CEO.

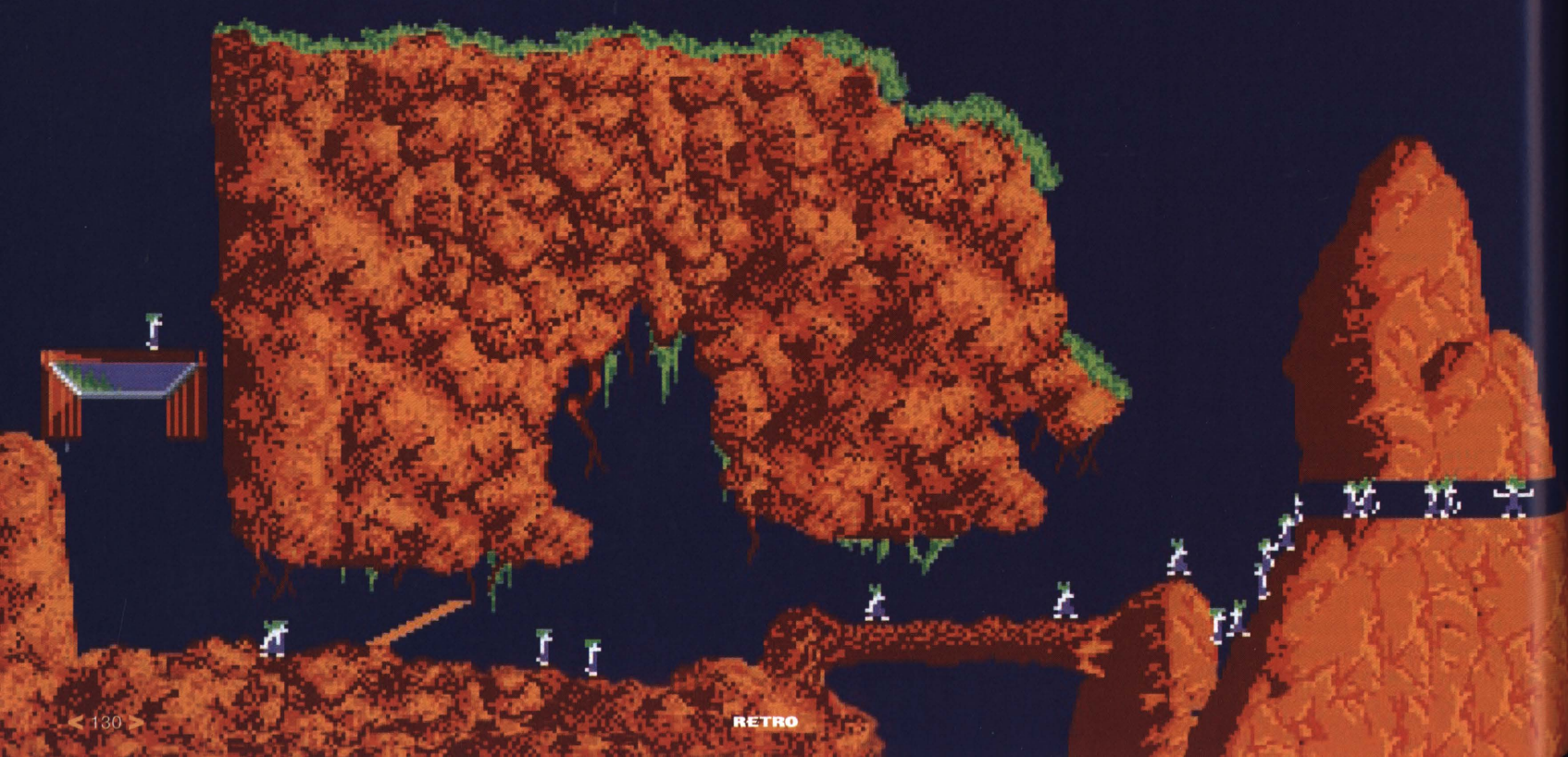
Sonic The Hedgehog helped Sega regain its commercial feet. The money-spinning accomplishments of the character outside of gaming may have been shamelessly milked, but it deserves to be remembered as a striking technical and creative 16bit achievement. Besides, it's been more than just lunchboxes, Y-fronts, and duvet covers.

"As a great F1 fan, I was very happy to have Sonic on the [1993] Williams cars and on [Alain] Prost's helmet," says Naka-san. Not bad for a creature that spends most of its time in the wild covered in lice.

Lemmings

True to the adage that success has many fathers, failure none, Dave Jones, Scott Johnston, Mike Dailly, and Gary Timmons recall their influence on a classic

Original format: **Amiga/various**
Publisher: **Psygnosis**
Developer: **DMA Design**
Origin: **UK**
Release date: **February 1991**

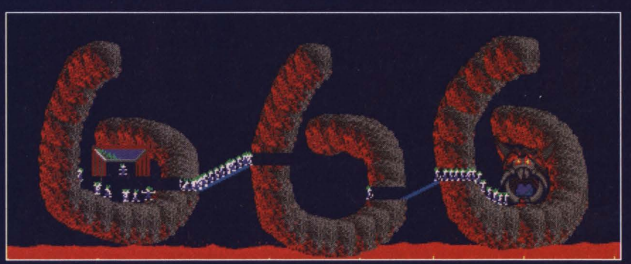


Here's a teaser: how do you get through the Steel Mines of Kessel without bombing too many Blockers in the upper chamber? Clearly, not an everyday kind of question, but nearly 12 years after release such queries are still being posted on *Lemmings* fan sites across the Net. But what accounts for its popularity so long after its initial release on February 14, 1991?

Lemmings clearly has that rare *Tetris* touch – the ability to appeal to hardcore and mainstream gamers alike, and ignore any sense that videogames appeal only to a niche demographic. Its immediacy and simple design was something which even the most technically inept parent could relate to, and, without question, it converted many to the joys of puzzle gaming. "It was great to make a fun game," recalls *Lemmings* designer **Dave Jones**. 'The fact that it was so simple, yet the levels could be deceptively tricky; people picked it up instantly – any age, any gender. Most of all, though, it was a fresh idea."

The title's enduring popularity among both mainstream and dedicated gamers is largely due to the simple core game mechanic. Preventing an unrelenting line of characters from falling to their deaths was an immediately understandable and compelling concept. In an industry that regularly produces software which stimulates the instinct to destroy, *Lemmings* was unusual in its insistence on making the player preserve life.

Attribution of credit for the *Lemmings* concept depends upon who you speak to, but its inspiration seems to be part experimentation among programmers, and partly a eureka moment for Jones. DMA coders **Scott Johnston** and **Mike Dailly** had an argument about how small a sprite could be and yet still retain character. Johnston believed



Quake and *Wolfenstein 3D* may have courted controversy, but *Lemmings*? The Deep South was shocked by the imagery on certain levels

that it could go no lower than 16 pixels; Dailly thought he could go down to eight. "It all happened in a day," explains Jones. "It was to be the third game I had written, and came about when one of the programmers at DMA had created an animation in *Deluxe Paint* that showed a bunch of little guys walking up a steep slope, and being blasted at the top by a big gun. The animation constantly cycled around, with a bunch of these little guys being blasted. I just thought: there's a fun game in that."

While Dailly clearly won the bet about the relationship between size and practicality, it was lead animator **Gary Timmons**' job to refine the personality of the lemmings. As he explains: "The challenge of the animation was in getting the player to believe he is really seeing the lemmings as illustrated on the box cover, and not just a small bunch of pixels. Part of this suggestion was to make the feet and hair look floppy, and that was a lot of fun to work on. Usually game character designs come before the sprites. With *Lemmings* the sprites were essentially completed before any concept art or design was done. When I came up with the look for the lemmings I tried to make them cute and vulnerable-looking. I wanted them to come across as quite mindless, and I think the change from the solid-colour eyeball in my first drawings to the sleepy eyed expression helped to achieve that."

> "A programmer at DMA had created an animation that showed little guys walking up a steep slope and being blasted at the top. I thought: there's a fun game in that"

Jones reveals that *Lemmings* was far from a meticulously planned concept: "The game was built up bit by bit rather than designed from the outset. Because it was very unique, there was nothing to benchmark it against." And, like Mario's dungarees, one of the most distinctive features of the lemmings – their green hair – was down to saving time at a technical level. "I reduced the number of colours to three [two-bit planes] so they could be used as sprites in a game with many onscreen at one time," says Timmons. "The lemmings have their distinctive green hair because it was easy to just slide the RGB sliders in *DPaint* to values for green and not have to spend time deliberating over colour."

Without question, *Lemmings* illustrates one of the most basic design principles: simple elements combining to produce complex interactions. This complexity derived from the capability to assign professions to the tiny lemmings to overcome the many perils put in their path. "It developed as we went along," discloses Timmons. "We all chipped in ideas for skills for the lemmings, and then I had to animate them to see which ones worked best. I tried to put life and humour into the animations. For example, the Miner had to appear to be putting effort into his work and the Basher was meant to look like he had big, heavy fists."

Eventually eight professions were created: Climber, Floater, Bomber, Blocker, Builder, Basher, Digger, and Miner. While tall rock pillars could be overcome by having a Basher dig horizontally through its structure, lava pits and water hazards might require Builders to place bridges over their treacherous expanses. It was the vast combinations of these functions which made *Lemmings*

such an innovative title. And, with 120 levels ranging from Fun through to Mayhem, it made for a supremely challenging package. Further *Lemmings* updates from DMA, such as *Oh No! More Lemmings*, plus countless custom levels designed by fans, have conspired to keep the *Lemmings* legacy alive.

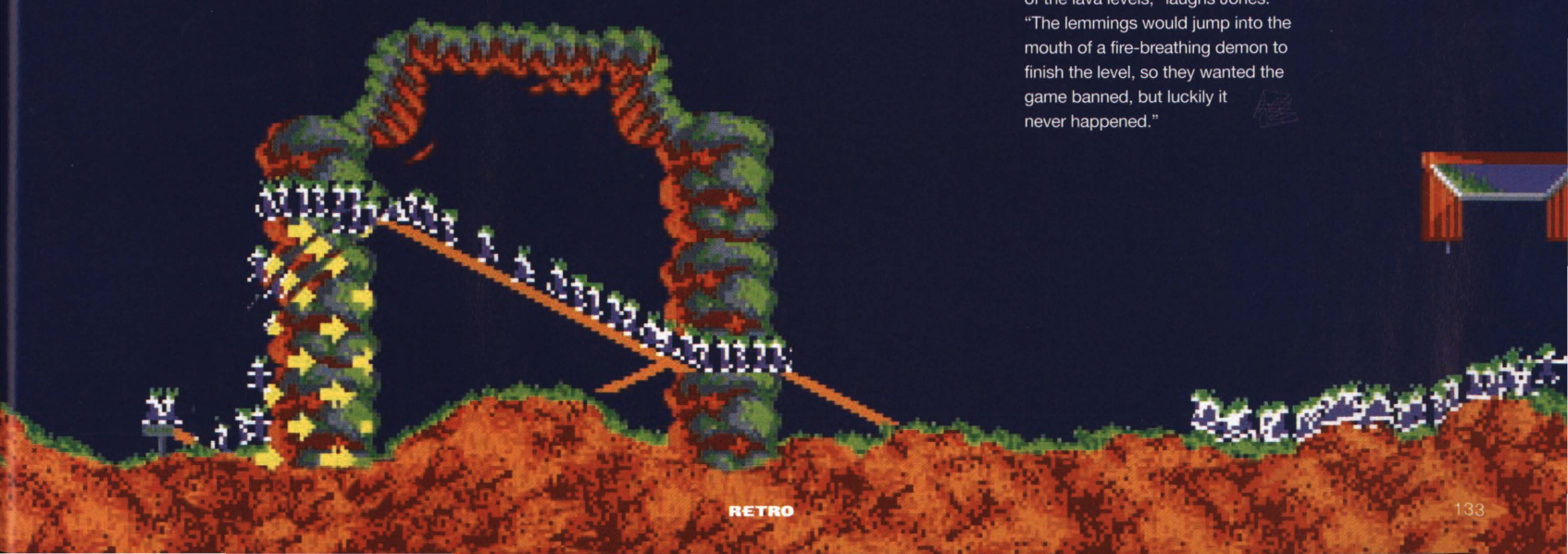
The purity of its design was clearly an inspiration to many, but back in 1991 it enabled the programmers to expend all their efforts on creating the many fiendish puzzles. "There was very little that I wanted to do that did not make it into the game," recalls Jones. "Level design was crucial, but we had a very good editor built into the game, and some talented level designers on board." More seasoned gamers will also have noticed levels modelled on DMA's previous titles, *Menace* and *Shadow Of The Beast*.

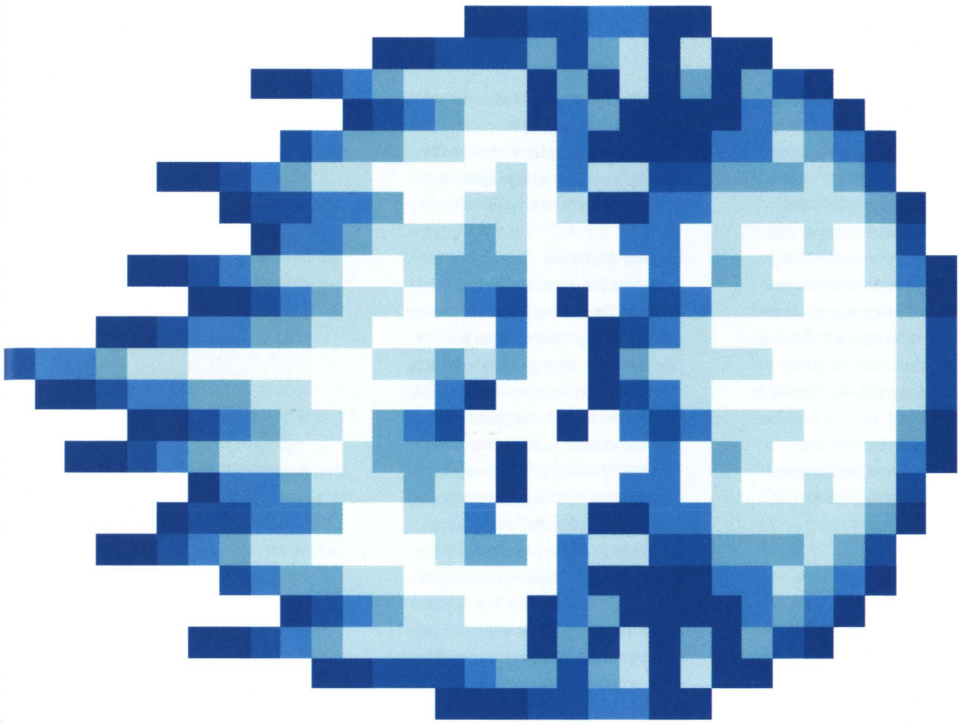
"Technically, I think the game was actually pretty simple," continues Jones. "It was good to show a game with lots of characters rather than just one. Every part of the game was pixel-perfect when it came to things like collisions and terrain following." Nevertheless, *Lemmings* wasn't created without some headaches. "The whole game required a lot of RAM," laments Jones. "This limited the play area, and caused a lot of problems when porting the game, especially to console. Maintaining the speed with 120 lemmings on screen was a little tricky, but the game made as much use of the Amiga hardware as possible. This once again made life difficult when porting to other machines, but that was someone else's problem."

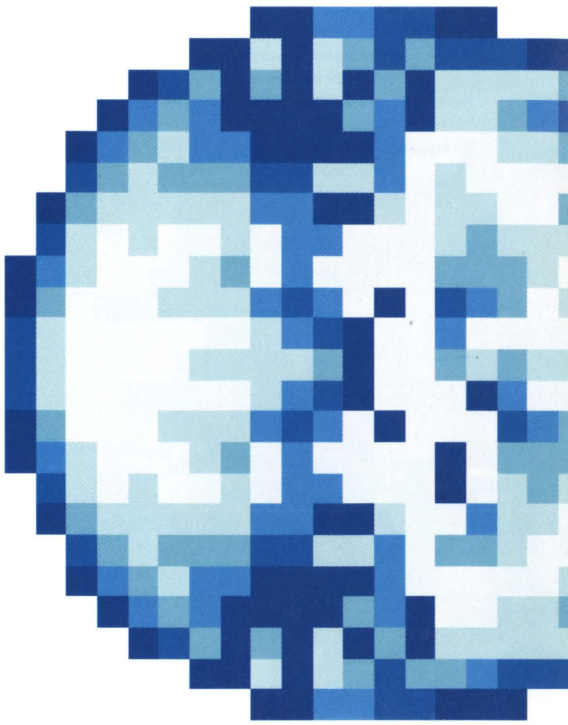
On its release *Lemmings* leaped headlong into the charts. The combination of its cuteness – Dailly's belief in character size clearly shining through – and strength as a puzzle game won it many accolades. There was something intrinsically alluring about saving those small sprites from their reckless movement towards certain death, although more sadistic gamers will remember the option to nuke all lemmings if the level was bodged. The game's celebrity was instant. "It was a great time," remarks Jones. "We had great review after great review. The game was in the top 20 for two years but most of the attention focused on Psygnosis, as they were the publisher. It's one of those things you have to accept in the world of videogames."

Timmons agrees: "It was an original concept with almost universal appeal that just seemed to hit the spot in the market. In the game, it was a lot of fun having direct control over one lemming at a particular point and then seeing the effect that had on all the other lemmings. Also, the appeal of the characters and the style of the music are two things that will probably be remembered for a long time. We were able to spend a lot of time working on the levels and grading them and we were generally quite pleased with the overall results."

But for those who only remember *Lemmings* as a brilliant if benign gaming experience, consider this: the game made network television in the US deep south for being an evil influence and inciting devil worship. "It seems that people over there were not happy with the style of the lava levels," laughs Jones. "The lemmings would jump into the mouth of a fire-breathing demon to finish the level, so they wanted the game banned, but luckily it never happened."







Street Fighter II

Created to catch a wave of interest in fighting games, it was a sequel born from obligation, not desire. Expectations were low; then people learned how to Hadoken. Remember?

Original format: **Coin-op**
Manufacturer: **Capcom**
Developer: **In-house**
Origin: **Japan**
Release date: **1991**

Remember: ↓↘→P ↓↘→P ↓↘→P It's that sort of game. The sort of game that breeds obsession.

"Oh, there have been many obsessive users," **Noritaka Funamizu**, the lead producer on *Street Fighter II*, thinks back and smiles. "I do have one example I can tell you about..."↓. "One young man, from the Aomori prefecture, flew to our office in Osaka and told the security he wanted to meet me."↘. "He said he had great ideas about a fighting game and he would not return to his home until he had made me read his notes."→. "I did not meet him. We gave him lots of goods and made him return to his home safely."P. Funamizu-san laughs.

"It was a great time," he continues. "I mean, it may have been the greatest time for our arcade sales. Our CPS-1 [arcade board] was just finalised and the first game was ready, *Final Fight*. We all wanted to make new things. I have real good memories of those times." And then he pauses, and that brings the inevitable futuristic caveat. "On the other hand, during the following years, the company became too big and we were always asked to make the same kind of titles,

Ken and Ryu's basic balance made them the most popular choice for beginners, but true *SFII* masters would learn how to excel with every character. One factor in the game's success was the arcade-culture show-off factor. Pride was beating an expert with Dhalsim

Final Fight-type games or fighting games. I became bored of this. But of that particular time, I have very good memories. I really enjoyed it."

It was 14 years ago, 1989, and Capcom, under pressure from its US branch, decided to start work upon a follow-up to its mediocre '87 beat 'em up, *Street Fighter*. Funamizu-san himself was unsure. "The first *Street Fighter* was not a success. But when everybody forgot about it, fighting games started to become popular in the US, so we were asked to make a sequel. When we presented *Final Fight* to the US, they asked us to make fighting games our priority. I felt uneasy. I mean, when we finished *FF* they told us we were wrong, that it would never succeed in the US. *Final Fight* became a huge success. It sold more than 80,000 units in the US."

Beating up cars and bricks provided a cute and unexpected diversion to players, but would also prove to be the unwitting inspiration behind combos

Crazy people

Despite its concerns, the Japanese developer threw all its resources into the game, installing Funamizu-san as producer and bringing in two more of its most respected designers alongside him. "Yasuda Akira was in charge of the character design, while Nishitani Akira [now CEO of Arika] was in charge of the game design. Two crazy people for sure. There were a lot of staff on the project, around 35 to 40 people, a hell of a size at that time – the maximum you could expect then would be 20. This was a record: I mean, there were 20 designers in charge of the characters alone. The entire project took around two years, and people said if *Street Fighter II* failed Capcom was over but, hey, come on, *Final Fight* was such a success that there was never going to be a problem."

Funamizu-san's plan wasn't built on subtlety. "I put everything I'd wanted to do for a while into it. I think that character design was half of the game's success – when we made them we had this feeling it would become something great. We started by thinking what special attack each character would use. Ryu and Ken were already defined, but, for example, we wanted a pro wrestling fighter so we started to think what kind of attack he would perform. When we had one ('Pile Driver'), it was obviously too unimpressive for the game so we had to make it much more spectacular. As we went deeper in the game we took an incredible amount of time finalising their moves… an incredible time."

But there was one thing that Capcom didn't really worry about. "Many think, wrongly, we put a lot of attention into the game balance but it is not true. Why do people play our games? Because they are fun. A game based on good balance alone is crap. What kind of fun can you provide when you push a button? What fun is there in pushing a button several times? Only a child has fun in simply hitting a wall or a surface again and again.

"The answer is in animation patterns. You have to design them, modify them until you have a very enjoyable result, optimal visual comfort.

Even if you've designed everything from the beginning, you always find during the development process the need to have a new kind of damage in the face of a given attack or situation. The relationship between the move and the damage is very important. That gives the player the comfort, the incentive for him to play the game. Then all you have to do is polish the thing, set the balance."

Accidental hero

But the need for extra animations wasn't the only thing that arose during the development process. "One thing is quite amazing: the combo. It was an accident. Really. While I was making a bug check during the car bonus stage – you know the one in which you have to destroy a car – well, while doing that I noticed something strange, curious. I taped the sequence and we saw that during the punch timing, it was possible to add a second hit and so on. I thought this was something impossible to make useful inside a game, as the timing balance was too hard to catch. So we decided to leave the feature as a hidden one.

"The most interesting thing is that this became the base for future fighting titles. Later we were able to make the timing more comfortable and the combo into a real feature. In *SFII* we thought if you got the perfect timing you could place several hits, up to four I think. Then we managed to place eight! A bug? Maybe." The quality-control reminiscence produces an afterthought: "Speaking of bugs, *SFII* had a hell of a mountain of bugs. I think it was a record inside Capcom. We built around 26 masters. So many days I spent in the office. But we made it at the end."

Millions of twitch-fighting thrill seekers will be glad they did. *Street Fighter II* was the defining point in the one-on-one beat 'em up's genesis, a game which offered instant entertainment for casual arcade browsers alongside an unsurpassed level of depth and strategy for devoted players. Not bad for a company which, at the time, was something of a minor player in the beat 'em up community. "I always considered our company as someone fighting with a bamboo stick. We didn't have the resources to equal Sega's or Namco's hardware. We had our own level of resources. While they were racing in F1 cars, we were in basic Hondas. However, we had great skill. If you take this little Honda, it has a very good engine and with only one litre of petrol it can cover quite a distance. Of course, distance is not an issue." He laughs.

"Our CPS-1 was made with this in mind. While it didn't offer the latest technology or CG, it was flexible, able to give the creators the possibility to use and modify data in all ways. It could handle a large amount of different graphics data onscreen. A rock would not be the same from one part of the screen to the next. It addressed many memory issues, which made our work easier compared to others. While Ryu was made in 8Mbit, we were able to make Zangief in 12Mbit. On other boards, you would have to make every character in 8Mbit. The hardest issue was to make the game fun. And…" Another pause, another moment of future-regret, "We did it so well with *SFII* that we've been asked to continue that for a long period, always fighting with our bamboo stick, and to keep people finding the same fun in our games."

So Funamizu-san would eventually find himself a victim of his own success, of his impulsive desire for over-the-top fighting fun, but oh, what fun: eight playable characters, each with an overwhelming arsenal of moves at their disposal, and, crucially, special attacks whose intricacy was proportional to their effectiveness. *SFII* soon dominated the arcades, and, regardless of whether it arose by chance or through design, the level of balance was stunning. Not flawless, though: dedicated arcade players would soon discover flaws like the 'tick', the act of using a light jab with Guile, forcing the other player to block, and following it up with an unstoppable throw. Still, the kinetic pull of the game was enough to see dubious tactics morally outlawed in all right-thinking arcades.

Cabinet shuffle

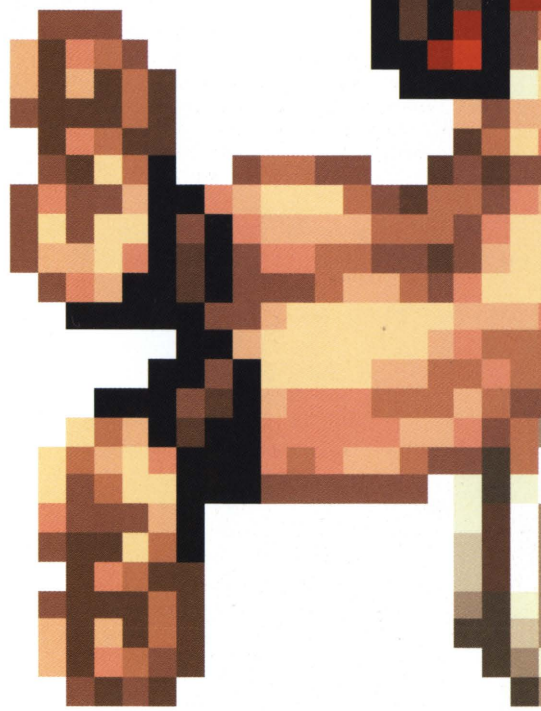
At the end of *Street Fighter II*'s dev cycle, the team finally got a chance to join the public in relaxing with its labours: "The work was over and we had so much free time. We gathered in the office and played games. We all thought the game would never sell much in Japan. We were sure the fighting boom would never happen. Well, in the US it already was and soon, fighting games started to be popular in Japan. The main reason is the cabinet. The normal way at the time was to have two players looking at the same screen, so they would sit together, side by side. One day we started to get complaints from people angry the game could not be displayed correctly. We were very concerned and unable to understand why. Then we saw it: someone had made a VS cabinet. It was one cabinet with two screens connected to it. VS. We were astonished… well, it was obvious that the game would have difficulty in displaying the data correctly.

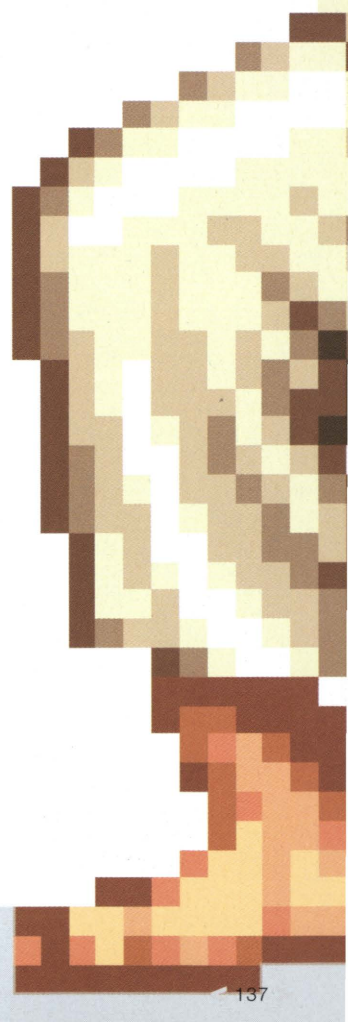
"So, anyway, we addressed the issue and the fighting game boom started all over the country. We made *Street Fighter II Dash*, and sales were so high. I mean the game cost around ¥150,000 or ¥160,000 [£820] and we sold about 140,000 of them. I can't even imagine such numbers now. We were selling arcade games as consumer games. Can you imagine? 140,000 units. At the same time copies started to flow in. When these copies were coming in great numbers from overseas, we had some feedback with people delighted by the high speed action of versions in Hong Kong, for instance. So we decided to make the *Turbo* version – we called it *Turbo* because it was faster." Recalling the increasingly strained titles – *Hyper Fighting*, *Dash*, *Championship*, *Super*, *Turbo*, and so on – of the hundreds of cross-system *Street Fighter* tweaks and spin-offs, Funamizu-san grins. "I tried to make sense of the titles back then."

Halcyon days

And that brings more 16bit romanticism. "Those days were much more interesting than now. I mean, many new things were possible. Now we are focused in making huge projects, costing a lot of money, ¥500 million [£2.6m] or ¥1.5 billion [£7.9m]. Adventure is not possible any more. Of course we were naive, and we got low salaries thanks to the company head, but we had this incredible sense of adventure you don't find today. Well, maybe it's not that impossible, but the meaning of adventure is different, faded."

Thankfully, some things don't lose their colour. Those who've experienced the recent *Alpha 3* on the Game Boy Advance – those obsessives who've memorised the combos, who can't put their hand on the D-pad without twisting it through quarter rotations – they will testify. *Street Fighter II* shines brightly, shines like ↓↘→P. Shines like a fireball.





Sensible Soccer

There are probably more videogames of the footballing ilk than any other. But for all the *FIFA*s, *Kick Off*s, *Championship Manager*s and *ISS*es, there's still one title that holds a special place in gamers' hearts..

The year is 1992. Sanctions would soon force Yugoslavia out of the European Cup, and the FA Premier League was about to begin its first controversial season, but by far the most significant event in football that year – if not the decade – was taking place in a small set of offices in March, Cambridgeshire; the offices of Sensible Software.

It began the year before. The six staff at Sensible, already one of the top development teams on the Amiga 500, were in a long and difficult final stage of development for their new god game, *Mega-Lo-Mania*. The game had originally been based around space technology, but – inspired by Peter Molyneux's *Populous* – Sensible made a last-minute decision to set the game on a fictional planet, base it loosely around the history of English warfare and add tiny little men to roam over the land.

"It was the toughest end development phase I can ever remember," recalls **Jon Hare**, *Sensible Soccer* artist, designer and Sensible Software co-founder. "The game just needed to be tuned, it was all about resource management, and it was really difficult – serious long hours for a long, long time."

To relax, the six of them played a lot of *Kick Off II*. Anco's football game was far from perfect, though, as the close perspective meant you frequently couldn't see who you were passing to, and the suspense often arose from the game's infamous bugs instead of from the skill of the players: would your goalkeeper fall asleep, or would the game hang? The problems grated on the Sensible team.

Then, one stressed afternoon,

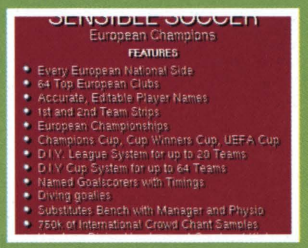
Original format: **Commodore Amiga**
Publisher: **Sensible Software**
Developer: **In-house**
Origin: **UK**
Original release date: **1992**

Hare decided the hard-working populace of their new game needed a break too, so for a bit of light relief he dressed 22 of the *Mega-Lo-Mania* sprites for a game of football. "It took me ten minutes," a laid-back Hare remembers. "I'd been making the Romans, and the cavemen, and then we stuck them in football kits." The development team put the men on a patch of hastily knocked-up turf, and "we saw the perspective was good: you could see more of the pitch."

They kept the up-down scrolling, added a ball, and fairly soon they were having a kickabout. Within a month, Sensible Software had a publishing deal for its new title: *Sensible Soccer*.

Released just in time for the European Championships, the game quickly became a universal favourite, scoring above 90 per cent in almost every magazine review, and 'Game of the Year' in a string of Amiga publications. There had been football games before: the fixed-perspective top-down view and up-down scrolling were familiar; but the scale of the men – just 12 pixels high – meant you could see far more of the pitch when playing. Taking a corner, you could now see your players in position around the goal. You could boot the ball forward and know someone was there to receive the pass. Like in the real game, attacks had to be built, mistakes were punished and it only took a second to score. And at the end of the day, it was the team with the most goals that won.

At the heart of *Sensible Soccer*'s appeal was the intuitive and flexible control system. The unique after-touch facility gave you unprecedented control over the ball: in the moment after a kick, a tap



Despite its seemingly laid-back approach to game development, Sensible ensures all its titles – *Soccer* included – feature flawless design and an intelligent range of options

towards another direction added spin or lift; sideways for a curved shot, back for an up-and-under. The system worked without possession too: you could dive into a sliding tackle, angle the joystick, and redirect the ball towards your well-placed striker. The quicker the after-touch was applied, the more exaggerated the resultant bend. Ball control got harder the faster you ran, and at full tilt an overly rapid change of direction often meant losing possession. They were simple ideas, but in combination the flexibility seemed endless, and the skilful moves seemed to echo the real skills of professional football.

Hare ascribes the fluidity of the controls to Sensible's informal attitude to development. "It was trial and error," he says. "You can't write a control system down on paper. If the control system doesn't work, you have to change it, and if you change the control system, sometimes you have to change the whole game. So it's really an organic process."

Around the pitch, Sensible built a menu system which provided the usual control over the circumstances of the match: you could choose from eight formations, swap players, and choose the length from three to ten minute games – ten minutes being, as always, a long time in football. During the match, three taps on your joystick called up the bench where you could substitute players or reassess your formation. The game offered instant replays, collected into highlights, and you could even save a batch of highlights to show at the weekend, for that 'Match of the Day' moment.

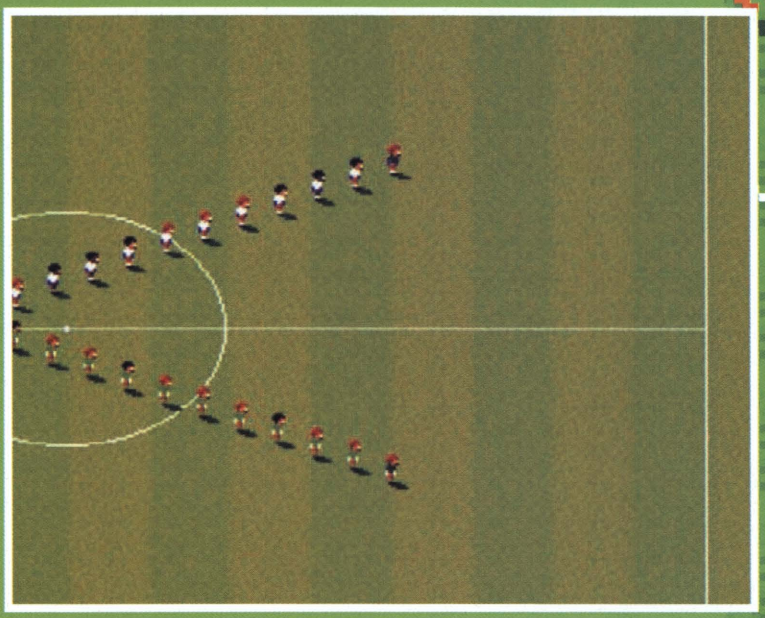
But the main feature that set *Sensible Soccer* apart was the new distant perspective and the space that it afforded. Hare agrees: "The game works because there's a lot of space to pass into. When you play football, you're not looking at yourself. You're looking at what you're going to do with the ball. You're thinking, 'I've got half a second before this guy's running into me: where can I kick it?'" Despite being only 12 pixels high, the players were – in their bug-eyed, cartoon way – absolutely convincing, even seeming to open their mouths in appeal after a foul.

However, as is often the case, most of this detail was an illusion. "*Sensible Soccer* was just a guy in three frames: legs together, then right leg forward, then left leg forward," explains Hare. "People would say, 'He's chesting it down, he's volleying…' What happened was the ball would have hit him about chest height and he'd kick it. The ball was just three frames too. The thing with football is that you know it well, and your head fills in the gaps."

> The game quickly became a universal favourite, scoring above 90 per cent in almost every review, and 'Game of the Year' in a string of Amiga publications

Space was key, too, in the amount of context left out. "A lot of what you don't do is as important as what you do do," outlines Hare. "If we had put specific chants in certain stadiums, then people would have noticed the chants aren't there in other stadiums. If you've got this general chant going on in the background, people might imagine at Anfield they're singing 'You'll Never Walk Alone'. It's general and ambiguous, and your brain fills in the rest."

Where details were included, Sensible took great care to make sure they were accurate. The game was the first to use real teams and player names. Sensible had one contractor, a European football journalist whose sole responsibility was to ensure players were up to date. "It's important to draw people in," says Hare. "When you have a lot of real footballers, like we did, people start to care about individual players on each team. People swore they could control the goalkeeper, when they couldn't. Or they swore this player was better than that player. What you have to do is give people space to believe it."



Among the raft of genuine player names available were a handful of the Sensible team, including coder Chris 'Chrix' Yates and artist Jon 'Jops' Hare – the original Sensible duo

The illusion of reality and smooth flow of play was supported by a whole range of subtle behind-the-scenes touches, again developed through trial and error, as Hare explains: "If you are pushing directly up the pitch, but the ball is actually 15 degrees off, the game will point you towards the ball. It's really helping a lot: bringing supporting players in, taking them out of position, in order to keep the game flowing without the player realising."

The heuristics the team used for the computer's tactics were basic and effective: each player was assigned a box, and his position within that box was determined by the location of the ball on the pitch. All that remained was to time when the computer players tackled, when they took shots and when they passed the ball. Hare remembers: "It was all quite simple, really." In fact – surprisingly, given the game's reputation for innovation – the development team is of the opinion that *Sensible Soccer* had little that was technically new. Hare calls it a 'bread and butter game': "It's just a football game, know what I mean?"

But to the game's millions of fans (1.5m units were sold, and Hare estimates the ratio of pirated copies to originals at ten-to-one) *Sensible Soccer* was always more than just a football game. Sensible set its stall out early doors, and then pressed its advantage home: a string of almost yearly releases kept the teams up to date, and added new features to tweak the gameplay. With release 1.1 the goalie was more responsive; there were red and yellow cards; even different pitches (a dodgy pitch being a great leveller). Later refinements were to include *Sensible World Of Soccer*, with 1,500 teams, 20,000 players, and a career mode for managing a team; and even *Sensible Soccer '98*, with 3D perspectives. But the original *Sensible Soccer* was always the one that would go down in history.

Is there anything in the original game people still might not have figured out? Hare is an ardent Norwich fan, and he admits to fixing the figures a little: "I think we did tend to favour our own teams a bit. Players I liked, my favourite Norwich players, I probably tweaked the stats up a bit, because I like them. You've got to. You don't want your favourite guy out there looking like a monkey."

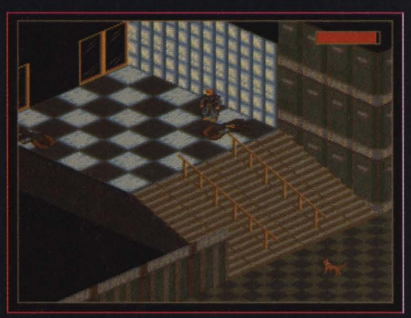
No. Especially not one 12 pixels high.

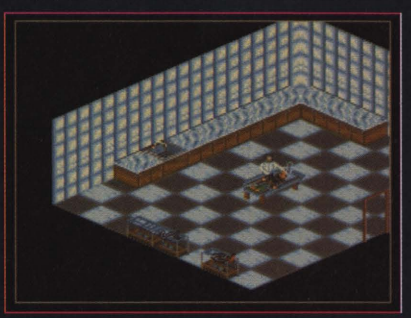
Shadowrun

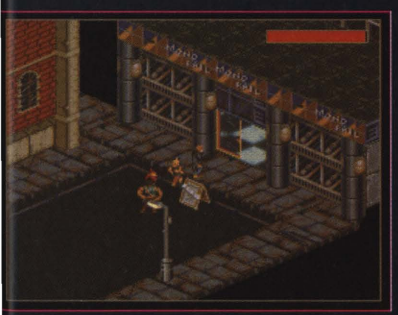
Innovative gameplay: poor sales. *Shadowrun* is proof positive that even in the 'good old days' of gaming, innovation wasn't always appreciated. The title's back story is similarly illuminating, as **Edge** discovers from creators **Gregg Barnett** and **Paul Kidd**

Format: **Super Nintendo**
Publisher: **Data East**
Developer: **Beam Software**
Origin: **Australia**
Release date: **1993**

One of *Shadowrun*'s finest moments: when a doctor inadvertantly activates a 'cortex bomb' inside Jake's skull, a panicked rush ensues to find a last-minute fix







Oh, fuck yeah! You chose the right game if you want a weird back story," blurts out *Shadowrun* co-designer **Paul Kidd** when **Edge** initially proposes an interview for a 'making of…' article. "This is the game that did so well in reviews that it got me fired."

For the modest number of Super Nintendo owners who bought it – and individuals now discovering it through emulation – *Shadowrun* is one of the finest thirdparty games of the 16bit generation. Ostensibly an RPG, its character interaction, scripted events and psuedo realtime combat system made it a distinct experience. The *Deus Ex* of its generation – Warren Spector's opus appears to owe it a clear debt of gratitude – the sheer quality of its design puts many modern games to shame. What makes it still more remarkable is the story of its torrid time in development.

A pioneer during the 8bit era, Australian codeshop Beam Software became more of a common-or-garden 'hit factory' with the advent of the second console boom. **Gregg Barnett**, creator of martial arts bonanza *Way Of The Exploding Fist*,

"I designed quite a complex combat system, where you could move your guys around like a team. If you moved into an area and were attacked, they'd scarper for cover"

was present at the company during this transition: "At Beam we were doing licensed games for the NES and SNES, and we got into a rut. The skill was making the most of what little you had with a limited brief. Every Nintendo publisher was buying any licensable property that moved. The industry didn't want to hear of anyone having an original game – only titles that involved some character, some 'product'. I was getting irritated with how the industry was going. The irony of *Shadowrun*, in many ways, is that it was symptomatic of why I wanted to leave."

When Data East acquired the licence to publish a SNES cartridge based on FASA's *Shadowrun* – a pen-and-paper RPG that appropriated its cyberpunk noir wholesale from familiar sources – Beam was appointed to fulfil coding duties, with Barnett leading the project. "I went away and spent a couple of months on an initial design," he recalls. "I remember wanting to take the RPG elements of the original and get it into a game that had an evolving storyline. FASA were very strict about how it would be presented, though – they didn't want it to stretch too far beyond their rule set. They took it extremely seriously. There was quite a bit of debate about how loose we could be."

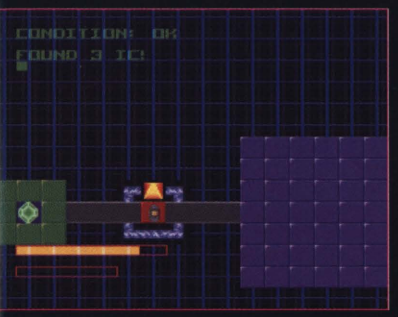
Barnett's initial vision for *Shadowrun*, tempered at times by FASA's determination to have the game remain consistent with the world it had created, differs from the final game in a number of respects. Fans who fondly recall hiring AI-controlled mercenaries for extra muscle during combat encounters may be surprised to learn that this element was originally far more involved. "I designed quite a complex combat system, where you could move your guys around like a team," reveals Barnett. "If you moved into an area and were attacked, they'd scarper for cover. You'd issue orders. It was going to be very tactical"

After sketching a rough draft of the plot, Barnett decided to leave Beam. "Gregg was doing *Shadowrun* when he went off to start his own company," says Kidd. "Because it had been Gregg's baby, for some reason no one chased it up. I thought it was actually doomed to fail. Data East came over, actually physically turned up in the building, to find out what was happening with their game. I was head of design at the time – although even the secretary was on more money than me – so they threw me in charge of *Shadowrun*. I tracked down Gregg and managed to piece all his notes together."

Kidd, understandably, was rather reluctant to work on *Shadowrun*: it was a mere seven months before deadline when he took up the reins. Worse still, his relationship with senior management at Beam was deteriorating: "With hindsight, I think it was a special kind of purgatory the boss had planned for me prior to giving me the push. I'd actually been at Beam for five years, and the bulk of my job was to come up with new stuff. I had an idea that I really wanted to do, so I took on *Shadowrun* on the understanding that I could get the wheels turning on my wonderful other game. Everyone knew that getting it done was going to be a nightmare, but that we'd get to do a great thing afterwards. The really funny thing is that I'd always hated the pretentiousness of 'cyberpunk' stuff like *Shadowrun*, too. You always get the shadowrunner standing on the rooftop, wearing shades reflecting neon lights, and a host of other clichés…"

"Gregg's design was massively over-complex, and a bit slow," Kidd continues, "but he'd left an architecture that we could work with. We kept his story, and I smoothed things over with FASA when we made changes to the design. We cannibalised sections of other games that Beam was working on at the time to get an engine in place. For example, we'd need a routine to move someone along a screen, so we'd grab the code from another game. The actual structure of it was done surprisingly quickly."

Thriving under adversity and almost entirely unsupervised, the team began to enjoy itself. One of its most radical departures from Barnett's design was the introduction of a realtime combat system. The result was a system whereby players, free to move as they please, summon a crosshair to fire weaponry and magic at opponents. Underneath this action-oriented veneer, however, *Shadowrun*'s battles owe more to turn-based designs. "We discussed both – realtime and turn-based – and I think we came up with a happy compromise," says Kidd. "We didn't want it to be too arcade.



We wanted something that an older, 'traditionalist' audience could also play."

Although the intricate (and, for the time, rather innovative) squad-based battles of Barnett's blueprint were discarded, the team retained the feature in part. The ability to hire mercenaries – controlled by simple but effective AI routines – also introduced a novel solution to a common RPG flaw: level upping. The act of fighting countless battles in order to improve your character's stats in an adventure game can be an arduous task. If your charge lacked the requisite statistics in *Shadowrun* for a particular event, you could simply employ others to compensate for his various shortcomings.

It was *Shadowrun*'s solid dialogue and use of cleverly orchestrated set-pieces, though, that made it so very compelling. It even featured events and snatches of conversation that would only occur under certain conditions, a feature that delighted completists. "I often like an environment that doesn't exist solely for the plot of the game," says Kidd. "Every character had multiple scripts, so people would respond differently in accordance with what you did earlier on the game. We were deliberately trying to do different things, to add bits that people would discover accidentally. We were all big fans of *Zelda* on the SNES. People were coming into the office after playing it all through the night. You'd go wandering through the wilderness, and you'd notice lots of things, but a new ability would make you think: 'I should go back and check that out again.' It was definitely a big influence at the time."

Shadowrun's many twists, turns and secrets – ranging from the small to the sublimely atmospheric – are far too numerous to relate here, but a few choice anecdotes spring to mind. The inclusion of telephones in certain locations allowed players to call certain characters for a conversation, removing the need to trek across a map to do so. At one point, it was possible to acquire the phone number of central protagonist Jake Armitage's nemesis, Drake. Those who found and called the number were told, once Drake became aware of their identity: "You're dead, Armitage!" *Shadowrun* was packed with such immersive and – amazingly – entirely optional moments.

One of its best set pieces involved the problem of reaching the rooftop of Drake's heavily guarded corporate HQ. Hiring mercenaries to assist in the ensuing fracas, players had to fight their way from floor to floor, hacking computers en route. "I remember that bit vividly – the big fight through the tower block," says Kidd. "Because we didn't have the time, there was a temptation to skimp. Somehow, though, we found the time to keep adding things. There was actually a lot more that we wanted to do, but eventually we just had to say 'Enough. We've got to stop.'"

Against all odds – including the team's desire to include feature after feature – *Shadowrun* was delivered to its publisher on the due date. "It was a furious grind but, because people liked doing it, it got done on time, much to everyone's shock and amusement," says Kidd. Data East was delighted with Beam's work; Barnett, who was then working at his growing start-up in England, recalls his surprise at the end result: "I saw glowing reviews in magazines, which amazed me, given the situation and time frame."

Kidd left the company shortly afterwards and currently works as a screenwriter, while *Shadowrun*, lamentably, became a 'cult' success, rather than the hit its quality should have guaranteed; the sequel promised upon completion never materialised. Ahead of its time in so many respects, *Shadowrun* ranks alongside the likes of Looking Glass's *System Shock* as one of the most cruelly underplayed classics in videogame history. If there was ever an apposite poster child for legitimising emulation in some manner, this game is it: despite its obvious technical shortcomings compared to modern works, it remains utterly engrossing.

An example of *Shadownrun*'s 'optional' elements, players could find objects from within the game world in order to acquire spells from the 'Rat Spirit' (left). These could make Jake's life easier, but were far from mandatory

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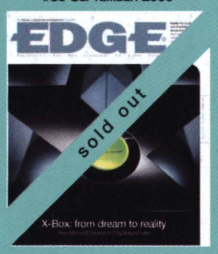

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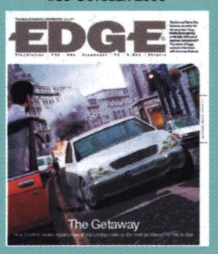

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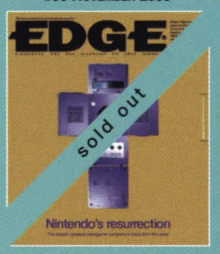

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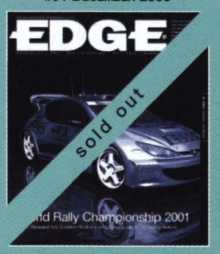

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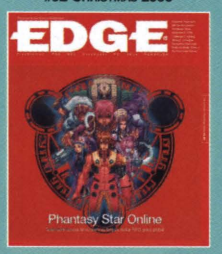

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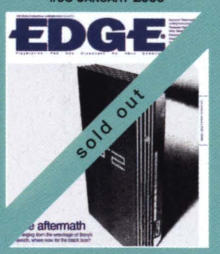

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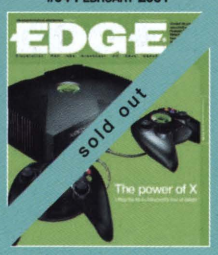

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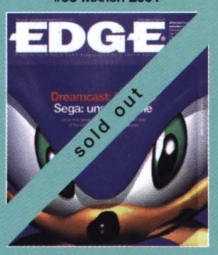

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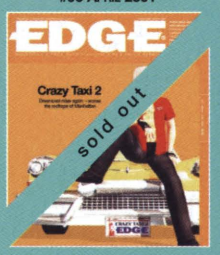

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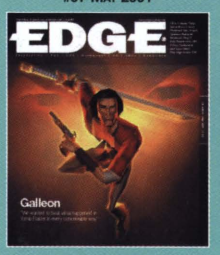

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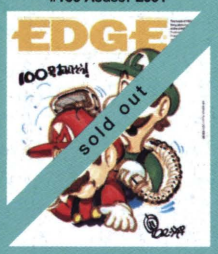

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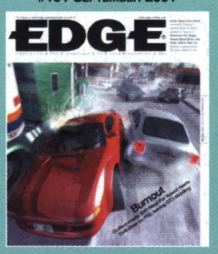

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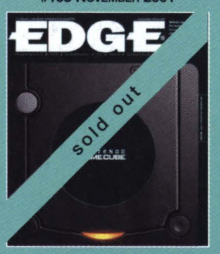

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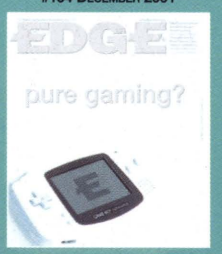

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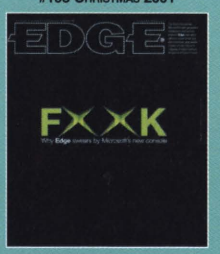

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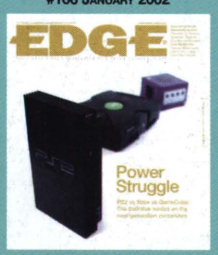

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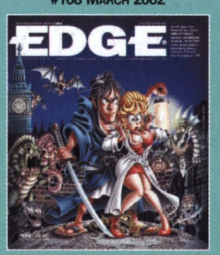

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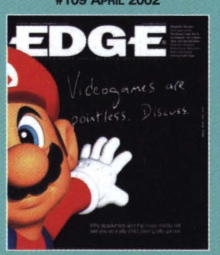

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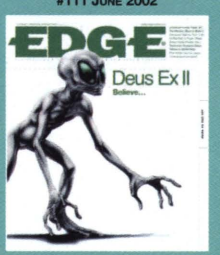

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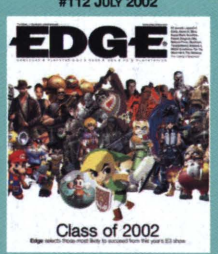

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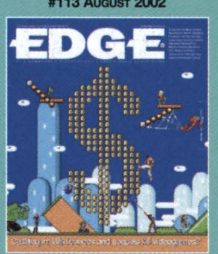

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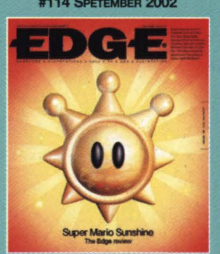

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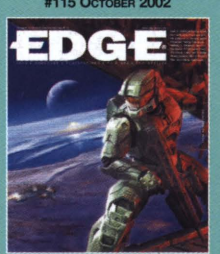

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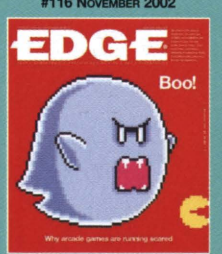

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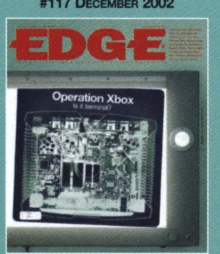

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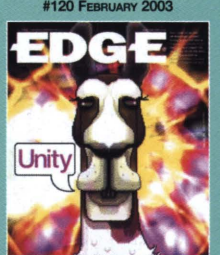

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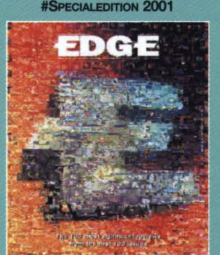

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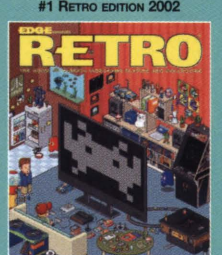

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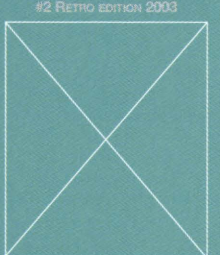

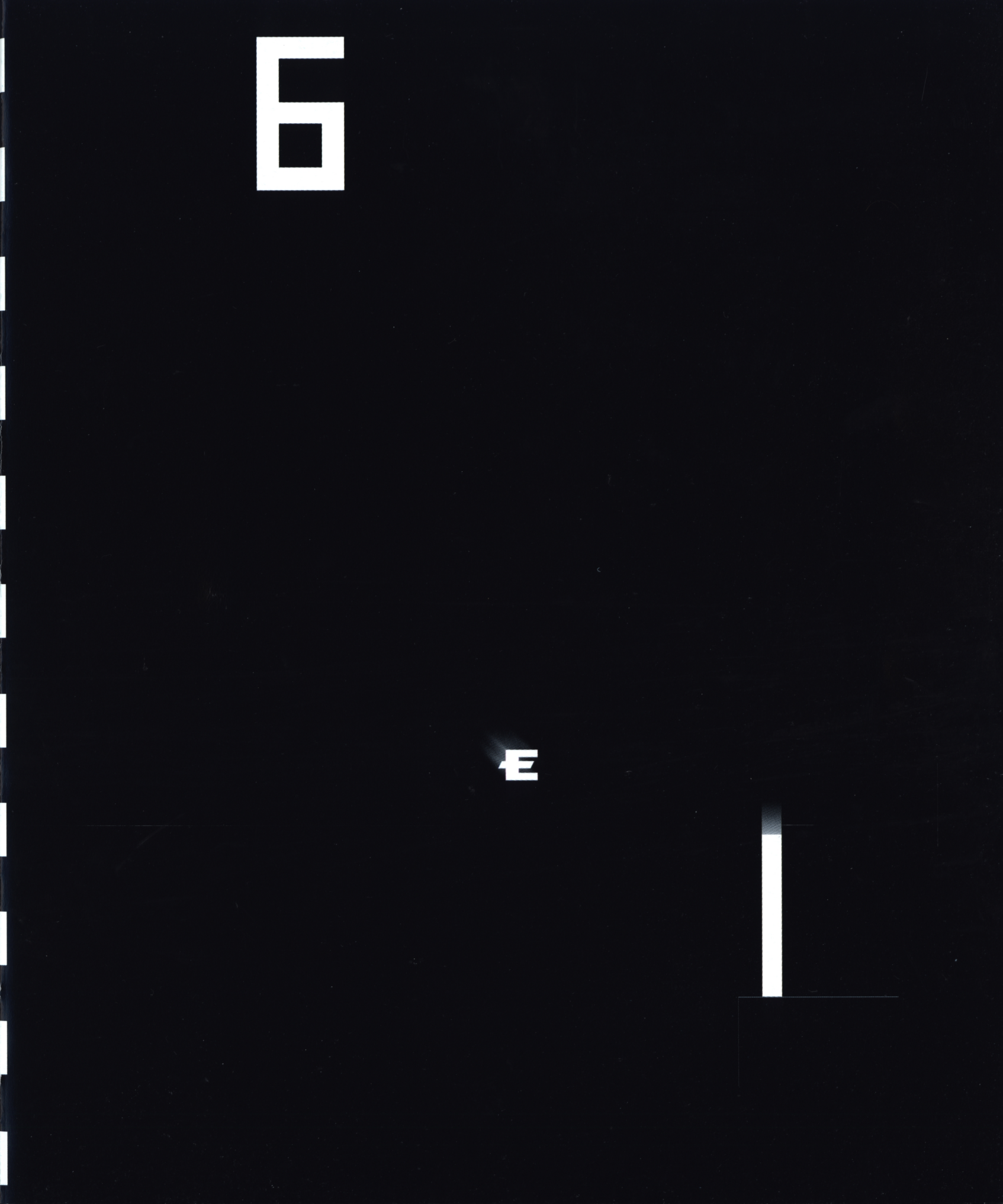

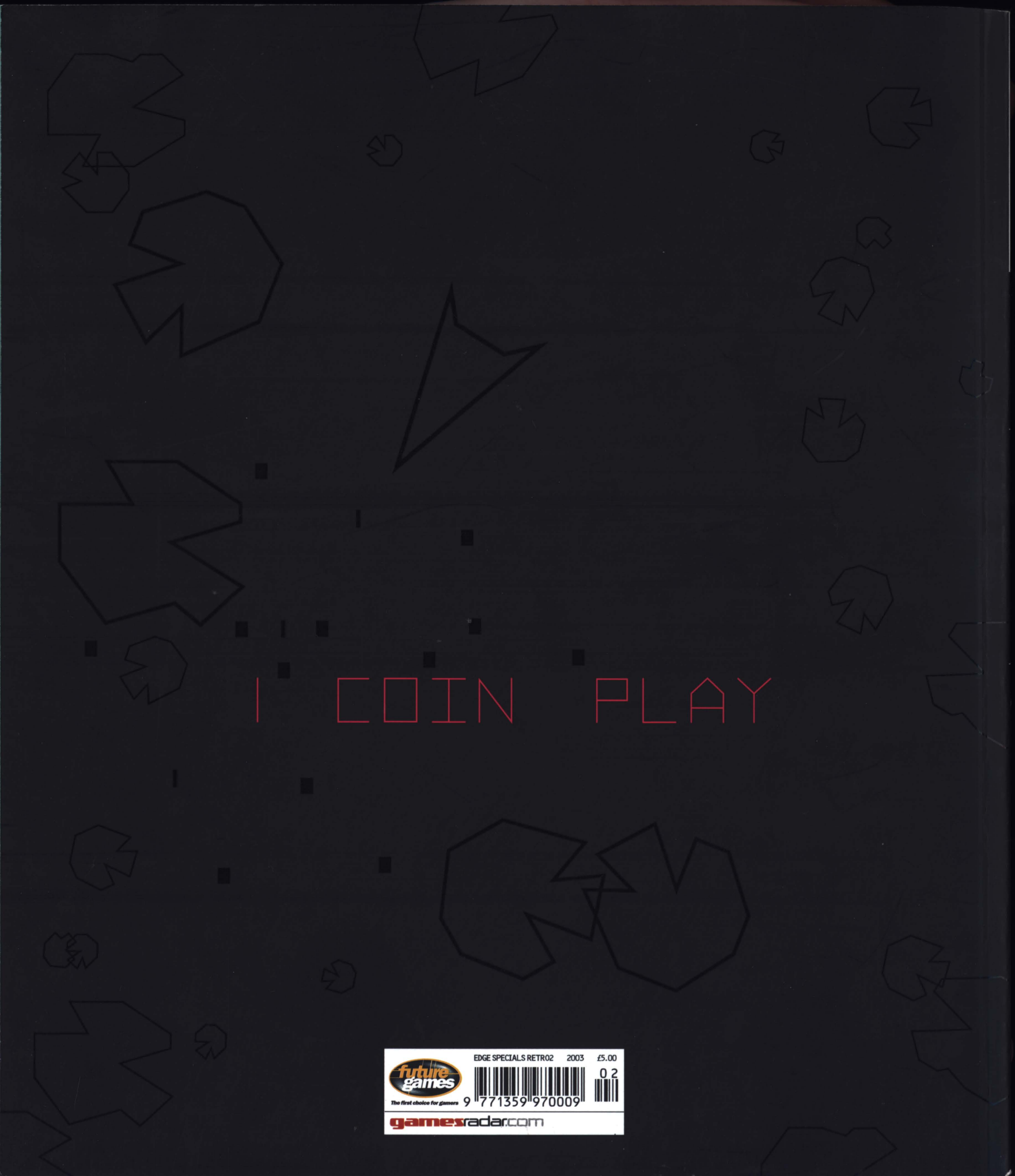

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